

AMERICAN VETERINARY REVIEW

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The AMERICAN VETERINARY REVIEW is issued on the 1st of each month. Manuscript and copy for insertion should be received by the 12th of the preceding month to insure insertion in the next month's number. Volume commences April and October.

Communications relating to publication, subscriptions, advertisements and remittances should be addressed to
AMERICAN VETERINARY REVIEW, 509 West 152d Street, New York, N. Y.

European Exchanges, books for review and personal letters should be addressed to
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AMERICAN VETERINARY REVIEW.

OCTOBER, 1913.

EDITORIAL.

EUROPEAN CHRONICLES.

Paris, August 15, 1913.

PRETHORACIC AND MALIGNANT TUMORS.—If I can judge by the literature at my hands, these forms of affections are more common in bovines than in horses. Indeed I find that only 18 cases have been recorded in those last animals. Among them there were tumors of various nature, cancerous, lympho and fibro-sarcomatous, lymphadenoma. This last being most frequent. But whether prethoracic or mediastinal, and whatever may its origin be, lymphadenoma is a very malignant morbid entity, which can be met with in all the domestic animals and also in man and which may be accompanied with secondary metastasis, invading most of the tissues and organs and like epithelial cancer give rise to a neoplastic cachexia.

At the Société des Sciences Vétérinaires of Lyon a very interesting case of *generalized lymphadenoma of the mediastinum in a horse* was recorded, having been observed by two army veterinarians, M.M. Lesbre and Velu, with the assistance of adjunct Professor Roquet of the Lyon school.

I will present the clinical history of this extremely interesting case, as it is a valuable addition to the symptomatology of such tumors in horses, where the diagnosis is sometimes doubtful and difficult; especially when the neoplasm has not the tend-

ency to generalization and when its presence is only manifested by secondary anasarca, localized to the anterior quarters and almost always also by hydrothorax. In bovines these tumors are not rare; their symptomatology is now well known; it resembles much that of pericarditis by foreign bodies and the differential diagnosis may be rendered possible by examination of the heart.

* * *

Gondole, a seven-year-old half-bred mare has never been seriously ill. One day she is found slacking in her ambition and is short-winded. In fact, after some hard work she is so unable to go on, that with great difficulty she is led back to her stable, where she arrives exhausted and literally broken down. After a few moments of rest, all the signs of illness have passed away and she settles down to eat her meal. Cardiac troubles are suspected. A short trot brings out again the same manifestations, hurried breathing, dyspnea, venous pulse, etc. Auscultation of the heart shows acceleration and violent beatings. Heart disease is diagnosed, digitaline and arsenious acid granules are prescribed. Eighteen days later, being taken out for a walk, she has a violent crisis with convulsive tremblings, acute moanings, etc. After this spell, which passed off rapidly, she remained about comfortable for a few weeks, although she is gradually losing flesh. At that time a new series of manifestation takes place. "At the point of each shoulder there appears flat swellings, circular, slightly cedematous, not adherent to the skin and corresponding to an hypertrophy of the prescapular and prepectoral lymph glands. This is followed after a few days by a swelling of the glands of the intermaxillary space, which rapidly increases and is then represented by a number of glandular tumors. With these swellings of the intermaxillary space and chest, a large cedema of the depending portions of the fore quarters develops and invades the head, chest and forelegs. The distended jugular veins are as big as a man's arm."

A diagnosis of interthoracic lymph gland adenopathy is made and the animal merely kept on observation without any treatment prescribed.

During the time that the animal remained under observation until death took place, some 8 or 10 weeks after, quite rapid loss of flesh was observed and cachectic condition gradually developed. The respiration had become slightly accelerated; the lower third of the chest was dull on percussion and silent at auscultation. Pleural exudation existed, and at various times was temporarily relieved by thoracentesis. Twenty-three litres of it being taken off altogether. The beatings of the heart were irregular, weak and not always perceptible. The pulse was filiform and intermittent. The temperature varied between 37° and 38° C. Micturation was frequent but not abundant. Towards the end of the disease ephidrosis appeared in the jugular grooves first and after on the flanks, the stifles, chest and arm-pits. These ephidroses disappeared one day, after a thoracentesis of seven litres being made, but it returned and spread as before. The mare died without violent struggling by dyspnea, after having been sick since October, 1912, to February, 1913, say four months.

* * *

The post mortem of Gondole revealed a most generalized invasion of the entire lymph glandular system in various degrees. The glands of the right side being more affected than those of the left. Those of the thoracic cavity weighed 8,000 grams. They were the largest. Those of the right kidney weighed only 62 grams, and between these two figures came the other lymph glands of the body. One of the principal lesions was found at the entrance of the chest and on the mediastinum. It formed an enormous tumor weighing 8 kilograms and was formed of three large masses as big as a child's head with numerous secondary ones attached to it. The whole mass embraced the trachea, œsophagus, carotid and all the nerves surrounding. It

pressed on the jugulars, the axillary veins and the anterior vena cava, which was partly obliterated by vegetations, as if the walls of the vessel had been run through by the neoplasm.

All the other viscera were free from lesions. The pleura and lungs were normal. There was some fluid in the pleural cavity. The pericardium was not inflamed, but contained little fluid. In the heart the only lesion was a few nodules on the mitral valve. The liver was big, congested and weighed 10 kilograms. The spleen was twice its ordinary weight, 1 kilogram 800 grams. The kidneys were normal, except the right which contained a glandular tumor weighing 62 grams.

The histological study of the primitive tumor and of several of the secondary nodules has shown that in all, the same structure existed, namely that of lymphadenoma.

* * *

DR. CARRELL'S NEW EXPERIMENTS.—Their object is relating to the artificial variations of activity of conjunctive tissue in its automatic life. These were presented lately to the Académie de Médecine in Paris.

Already several months ago experiments of Dr. Carrell had demonstrated that a piece of chicken foetal heart was beating normally more than three months after the removal from the organism and that cultures of conjunctive tissue did rapidly grow in the beginning of the fifth month of their existence *in vitro*. These experiments were kept up. Colonies of conjunctive cells, from the same piece of heart, removed more than fourteen months ago, to-day develop with great activity after having been submitted to 166-167 passages.

The examination of the tissues formed by these cellular colonies showed the existence of a constant relation between the rapidity of their growth and the composition of the media. This fact indicated the possibility of regulating the rapidity of the proliferation of the conjunctive cells in the same manner as the activity of microbial cells can be modified.

The experiments were made with colonies of conjunctive

cells, which since a year were living outside of the organism and developing with a constant rapidity. Those tissues were submitted to more or less frequent passages in plasma alone of adult chicken or in one to which were added variable quantities of embryonic extract. It is known that these extracts, with also certain tissues of adult animal, have the property of activating, from three to forty times about, the rapidity of the growth *in vitro* of conjunctive tissue. After each passage the primitive piece was rapidly surrounded with a more or less wide areola of new tissue. The density of this remained about the same all through the last of the experiments.

The width of the areola which was formed round the original piece was measured with the micrometer or a photography of the culture was taken. The examinations and the mensurations were generally made forty-eight hours after the passage. Each experiment was rigorously controlled by a control culture.

The experiments can be divided into two groups according to the activity of the cell proliferation being reduced or increased.

* * *

1°. Colonies of cells, which became surrounded in forty-eight hours with a ring of new tissue, 0 m. m. 7 or 0 m. m. 9 wide, were cultivated in normal plasma of adult chicken. During the first forty-eight hours their activity diminished much. They were then submitted to another passage in an identical media. The growth became very slow; it was about 0 m. m. 115 in forty-eight hours, while it remained at 0 m. m. 9 in the control culture. The size of the tissue then ceased to increase, as, at each passage, a certain number of the cells were destroyed, and their losses, small as they were, were sufficient to take off from the tissue the gain of its slow growth. The mass could remain stationary for several weeks, and yet the cells continued to proliferate. Sometimes the proliferation would stop entirely and the tissues would die. The plasma of adult animal would not permit a marked increase in the mass of the cell colonies

which were cultivated. A diminution in the activity of the tissues could also be obtained by keeping exposed to a temperature of 35° - 36° C. instead of 39° , or in exposing them for four or five days to similar surrounding temperature. The colonies of cells, whose activity had thus been reduced, continued to proliferate slowly, when kept in that same surrounding. But if they were placed in their ordinary media, they would regain their original activity after a few passages.

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2° . The addition to the normal plasma of an adult animal of a small quantity of extract of tissue produced at once an increase in the mass of the cell colonies. A piece of tissue cultivated in a media composed of two parts of plasma and one of embryony extract, slightly diluted, is in forty-eight hours surrounded with an areola of new cells, whose width is about 0 m. m. 9 and keeps increasing very rapidly. In a few days it is double its size, and it became necessary to divide and subdivide it. When more condensed extracts of tissues were used or again if the colonies were submitted to daily passages, during several days, they would, in forty-eight hours, produce a ring measuring 1 m. m. 5 and even 1 m. m. 80 in width. In this last case the growth of the conjunctive tissue was forty times more rapid than with normal plasma. The increase in the mass of tissue during this short period is wonderful. In other cultures the rapidity of the growth was even greater, and to such an extent that the quantity of conjunctive tissue, formed at the expense of the media, was relatively enormous. *This great increase of size proved that, in these experiments, they were not phenomenas of survis, analogous to those observed by Carrell and others, but that it was a new fact, namely that of conjunctive cells living and multiplying indefinitely in their media of cultures as microbes do.*

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Those experiments then have shown that colonies of conjunctive cells which have lived more than one year outside the organism, had kept their faculty of increasing much in size and of giving birth to quantities of other colonies. They also have shown that the rapidity of cell proliferation can be regulated as easily as the activity of micro-organisms. Those cell colonies, in a given and constant state of activity, will, without doubt, facilitate the study of the physico-chemical factors in the growth of tissues and may perhaps, one day, serve as reactive for the diagnosis of the dynamic properties of the tissues and humors of the organism.

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ABDOMINAL SURGERY.—Abdominal audacious surgical interferences of almost all kinds are so common in human medicine that the most delicate and the most serious are often recorded without receiving the attention that they deserve.

In veterinary medicine, since the days of asepsy and antiseptics, operations on the abdomen have become more frequent. Common for smaller animals, they even have made their way for larger, and it is not unfrequent now to read in our professional journals records of cases of laparotomy, enterotomy, etc., many of which have been followed by recovery. I have just come across one in "*Il Moderno Zooiatro*," which I think deserves publicity.

The record is headed "*On the Diagnosis and Surgical Treatment of Enterolithiasis in Solipeds*," and relates a clinical observation of unusual interest, because: 1° a double operation, laparotomy and then enterotomy were performed on an animal over fifteen years of age, which had an intestinal calculus of enormous size, weighing 7 kilograms 845 grams, say over 15 pounds and a half. The operation was followed by radical recovery: 2° because the diagnosis of intestinal calculus was made out by external manipulations; 3° because the seat of the calculus in the cæcum was made out and confirmed by the opera-

tion, a localization, which explains how such an enormous stone could have remained so long in the organism without preventing the passage of the food and giving rise only, now and then, to slight intermittent colics.

The operation is thus described.

* * *

The mare was bay and fifteen years old. She was brought to the veterinary school for being lame. While she was examined a peculiar deformity, in the profile view of the inferior abdominal wall, was noticed on a level with the xyphoid cartilage of the sternum. By palpation, the presence of a very heavy and large mass, slightly mobile, was made out. Rectal examination was negative. A diagnosis was made of intestinal calculus, located in the diaphragmatic curvature of the colon or the anterior portion of the cæcum. The owner, telling the history of his mare, stated that after meals she was subject to abdominal pains of short duration.

The mare was abandoned to the school and Prof. Pietro Ghisleni decided to operate on her.

The animal, properly prepared, was cast on her back and brought under the influence of ether. Laparotomy was performed, an incision being made, 30 cm. long, a little on the left of the median line and extending from the xyphoid cartilage to in front of the umbilical cicatrix. After laceration of adhering tissues, both hands were introduced in the abdomen, but even with the aid of an assistant the calculus could not be raised from its position, and the operation was given up. The wound was properly secured and dressed and complete healing obtained in twenty days.

Two months later a second operation was attempted. The animal was thrown on her right side and anesthetized with ether. An incision was made on the left abdominal wall, parallel to the linea alba, a little above the cicatrix of the first laparotomy. The calculus was then found located in the anterior part of the cæcum.

An assistant introduced his arm in the abdomen and with both hands of the operator the mass was brought outside. The contents of the cæcum were pushed upwards towards its base, a strong ligature was applied on the organ to prevent their falling back and also one towards the point of the cæcum. The intestinal walls were then incised and the stone extracted. The sutures of the intestines were carefully applied, serous against serous, and the wound of laparotomy closed. The stitches were removed after 12 days and a complete cicatrization obtained in 20. The mare went to work and never had colics after.

* * *

CANINE ISO-SEROTHERAPY.—A new application, which deserves attention, is that which has been made and recorded at the Société de Pathologie comparée by MM. Lepinay and Beausillon.

Very interesting results have been obtained in human medicine in the treatment of some affections with the use of human sera, such as in the accidents of pregnancy, gastro-enteritis and broncho-pneumonia, which were favorably influenced by injections of serum from healthy men or women, free from tuberculosis or syphilitic tares.

From these data the authors of the article had decided to experiment on dogs, with canine serum, obtained by centrifugation or decantation, with blood taken from the saphena. This serum possesses the maximum of properties, when it is used fresh, immediately after the bleeding, as it still contains a certain quantity of thrombine, a coagulating substance of superior excellency.

It is to hypodermic injections that the authors resorted in preference, as the mode of administration. These injections are well supported, are not painful and leave no marks. At the most, they may bring in twenty-four hours a thermic elevation of one degree, which disappears rapidly. A dose of 5-10-15 cubic centimeters is injected on the inner side of the thigh and can be repeated several times in succession, without bad effects or

inconvenience. Following the absorption of the injected fluid there is a noticeable increase of globular percentage in the blood, in the hematos and leucocytes, and the coagulating properties of the blood of the animal treated are well elevated.

In hemorrhagic enteritis, which is so frequent during attacks of distemper, in post-operative hemorrhage such as after the amputation of the ears or removal of tumors, etc., most satisfactory results have been obtained. Even in these last cases the internal administration may be rendered more perfect by the application of serum with the dressing.

As it has proved that "if the day after a copious bleeding, serum being taken during the full hematic crisis of regeneration and injected into a fresh animal, this would present twenty-four hours after the injection a great and lasting hyperglobulia," the authors have by successive bleedings prepared homopoietic sera, which, when injected into healthy dogs, gave rise to great hyperglobulia, the number of hematies being raised from 4 or 5 millions to 6, 7 or 8, and that of the leucocytes from 8,000 to 10,000 to 25,000 and 30,000.

On the day following, the red globules still increased in number, and 10 or even 12 millions could be counted. After 10 or 12 days the equilibrium had returned.

By this treatment anemic animals have been benefited, recoveries and improvement during distemper were obtained and intestinal hemorrhages were rapidly arrested.

These results that the authors record are very encouraging and certainly deserve attention, as the application of the method may prove a valuable means to reinforce the resistance of animals against the invasion of microbial germs and perhaps be of great advantage in general practice.

* * *

BIBLIOGRAPHY.—The report of the NEW YORK STATE VETERINARY COLLEGE for the year 1911-12 is as complete as it can be made and shows the great and valuable amount of work of the institution.

Director Dr. V. A. Moore, addressing the report to Acting President T. F. Crane, after concise generalities, considers the subject of the faculty, the statistics relating to the number of students and the standing of the graduates, the plan of instruction and the arrangements of the three years of studies, then the diagnosis work, the examinations relating to some contagious diseases, the distribution of sera, and concludes with the consideration of the needs of the college and the recommendations that are indicated.

This part of the report is interesting in a general way. The appendix, which forms the largest part of the volume, speaks of the real work in some details and is the part which will attract the attention of veterinarians, of intended students and of scientists of both medicines, human and veterinary. After the reports relating to the practical teaching in the clinics by Prof. Williams, there are a series of articles from Director Moore, Professors Fitch, Burnett, Frost, Bolton, Birch and Jones on various subjects, such as glanders, arterial scleromatosis, abortion and sterility in cattle, etc. Several of these articles are handsomely illustrated.

The report is one which other similar institutions ought to take as model to show their work.

* * *

I have also been favored with the report of the VETERINARY DIRECTOR-GENERAL AND LIVE-STOCK COMMISSIONER, Dr. J. G. Rutherford, for the year ending March 31, 1912. It is a large volume of nearly 500 pages with a few illustrations, where our worthy confrère, Dr. Rutherford, has collected the great amount of good work carried out under his directions by the excellent staff of veterinarians he had with him. There are contained in the book many interesting reports.

* * *

Quite an interesting volume has been received also from PARKE, DAVIS & Co., the great firm of Detroit, that every veteri-

narian knows, whose title says in a few words the object: "*Collected Papers from Research Laboratory.*"

It is a neat book of nearly 300 pages, gathering the reprints of the valuable work done by the investigators of the laboratory of this firm, as they have been published in several medical and veterinary papers in the United States and in England.

The idea of collecting all these publications into one volume is a very good one, as one may at once find out those which may be of special interest, without being obliged to inquire and look, some time without good success when and where such papers have been published.

This volume is numbered as the first, which indicates that others will follow. They will make a good addition to any library.

* * *

Other Acknowledgments.—Bureau of Animal Industry, Bulletin 166 on *Chemical Changes Produced in Cow's Milk by Pasteurization*, by Dr. Philip Rupp, Ph. D.

Veterinary Notes for June, 1913.

Archives des Sciences Biologiques of the Imperial Institute of Experimental Medicine of St. Petersburg.

The West Australian, with a valuable contribution by Dr. E. A. Weston on the use of tuberculine test.

A. L.

A GOLDEN LEGACY—TO THE PURPOSES AND
POSSIBILITIES OF WHICH WE HAVE
NOT BEEN INSENSIBLE.

The closing meeting of the first half century of the life of the American Veterinary Medical Association has passed into history; and, with a thousand persons in attendance, including the ladies that graced the occasion with their presence, and the

scope and character of the work accomplished, has set a pace for those that are to come after it that will permit of no relaxation of the energy that has characterized its work in the past. Nor do we anticipate any; for the noble pioneers of our profession who laid the foundation of this splendid organization fifty years ago planned better than they knew, and so through these fifty years it has gone onward and upward, each year's gathering marking an advance of the previous one, and so it will continue down through the next half century, yearly increasing the breadth of its work and the extent of its usefulness in developing and elevating veterinary science, until it shall have reached a first place among the learned professions.

Let us glance back over the activities of this last great meeting and endeavor to determine whether its accomplishments have been in keeping with the greatness of the occasion; the return to the scene of the association's initial activities, after fifty years, during which it has pitched its tent in every quarter of the United States and twice on Canadian soil.

Would the character of this conference, held upon the old camping ground of the group of practitioners who laid its foundation there half a century ago, meet with their approval? We feel sure that it would. We feel further assured that it would have surpassed the hopes and ideals of the most sanguine of them, could they have but beheld that great congress of veterinarians in New York last month and followed them through the immense amount of work that was accomplished, and the manner in which it was accomplished in those five days. We have referred to the organizers as a group of practitioners, and such they were; ideal practitioners; broad thinking men, filled with an ambition for greater scientific attainment by their profession; and could they have been present at this Golden Anniversary meeting of the association which they organized, they would have seen that their ambition had been realized (*greater scientific attainment by their profession*), with the group of practitioners (only a very much larger group than the original one) still occupying a central place in the organization, flanked on every

side by those whose live work has taken them along lines of investigation of subjects which, while perhaps more properly classed amongst scientific research work, still are directly related to, and are part of the everyday life of the practitioner. Each is equally important to the other. For example, had they peeped into the room where the section on Sanitary Science and Police were in session, they would have observed that all the practitioners that could squeeze in were present, listening just as intently to papers presented by pathologists and others on subjects of vital importance to them as they did in the sections on medicine and surgery. In short, we were impressed by the very patent evidence of the breadth and scope of the fiftieth anniversary meeting of the American Veterinary Medical Association, and its healthful condition, manifested by its literary programme. No subject was too scientific and technical, nor too practical and commonplace, to merit a position on it. Every phase of professional interest was represented. We were further impressed with the great importance of this national organization as an educational factor. We all know of its great service in the elucidation of subjects of national importance, but how many of us realize how much of an individual educator it is to each of those who attend its sessions closely. Local organizations are apt to be made up of members whose interests and daily tasks are more or less in common. Here is a society made up of city practitioners, there another of country practitioners, and still another of B. A. I. men. And still other veterinarians, whose work has gotten them into the channel of pathology and bacteriology, become members of associations of that character, such as the Pathological Society of their city and the Society of America Bacteriologists, etc., etc. The result naturally following that each of these groups are developing more strongly in certain directions; and they come to the American Veterinary Medical Association meetings each year to discuss the subjects in which they have been working during the interval that has elapsed since the previous one. What is the outcome? A *general* exchange of advanced ideas such as cannot be obtained in any

other way. So that the American Veterinary Medical Association has broadened its scope to a point where, in addition to benefitting veterinary education by raising the standards of the veterinary schools, it also does so by stimulating the members of the profession in general to wrestle with the vital questions of the day, that they may be in a position to present them to better advantage at each succeeding annual convention. The result of that stimulus was plainly evident in the direct, clear manner in which subjects of such vital moment (not alone to the veterinary profession, but to the general public) were presented at the fiftieth anniversary meeting. This has not come suddenly, but is the result of the continued annual association with each other of men from all over the country who are looking at and studying things from diverse viewpoints, and frequently under vastly different conditions. There is nothing new or strange about this that prompts us to speak of it at this time; it is merely referred to as another instance of the inestimable value of the Golden Legacy left us by the men who met in the Astor House on June 9, 1863, to make plans for the realization of *greater scientific attainment by their profession*. We regret exceedingly, therefore, that the one living, active member who was present at that first meeting could not have been present to have seen the direct, lucid manner in which the following questions, equally vital to the veterinarian and the whole people, were presented and dealt with; while we realize the great sacrifice he has made uncomplainingly, because a higher, nobler duty made his presence impossible. Take the glanders question, for example. Veterinarians in large cities throughout our country have seen millions of dollars worth of property taken away from the merchants, manufacturers, contractors, men in all mercantile lines in fact, to say nothing of the family pets, family horses and children's ponies that have had to be sacrificed by this dread disease. And in addition to this loss from a commercial aspect, they have seen human beings succumb to this loathsome plague. It has aroused them, and they have been laying their cases before the national organization each year for some years back; but not

until our retiring secretary organized the section meetings, which had been under consideration for some time, was the national organization in a position to handle these big questions as it is to-day. Now each section sits as a special tribunal, under the direction of a specially selected man especially suited by his life-work, to assist in the elucidation of questions to come before his section. The same applies to those who are to present the questions. The result is, that those seeking information get it from the most authoritative sources, presented in the clearest, most precise and direct manner. We have referred to the glanders question. Now let us see how that question was prepared and presented at the section to which it was assigned.

In the first place, a *special committee was appointed by the president soon after taking office (nearly a year before the meeting at which it was to report), "*For the Detection of Glanders.*" The personnel of this committee is most interesting, and indicates its peculiar fitness for the task of collecting and presenting educational facts in relation to glanders. E. B. Ackerman, Chairman, general veterinary practitioner in a large city for the past twenty years and veterinarian to the Contagious Disease Division of the Health Department of that city during practically the same period of time; Adolph Eichhorn, Senior Bacteriologist, Pathological Division, Bureau of Animal Industry, at Washington, D. C.; C. D. McGilvray, practitioner of veterinary medicine, engaged in municipal sanitary regulation work and teacher of veterinary science; Charless Cotton, general veterinary practitioner in large city, and engaged in glanders eradication work; Charles Keanè, State Veterinarian and teacher in a veterinary college; John Reichel, Veterinarian, Bacteriologist and Pathologist. These are the men who had been busy for a year compiling facts for their report before presenting it, in which report they studied glanders from fourteen points, as follows: (1) Cause. Variation in Virulence; (2) Animals Susceptible; (3) Period of Incubation; (4) Modes of Infection; (5) Manifestations, Symptoms, Prognosis; (6) Diagnosis: Mallein—Subcutaneous,

* Report will be published in a subsequent issue of REVIEW.

Ophthalmic, Cutaneous; Laboratory—Cultural, Animal Inoculation Test; Blood Test—Opsonin, Conglutination, Precipitation, Agglutination, Complement Fixation; (7) Differential Diagnosis—Clinical, Laboratory; (8) Pathological Anatomy; (9) Quarantine—Clinical, Occult and Exposed Cases; (10) Disposition—Clinical, Occult and Exposed Cases; (11) Treatment; (12) Disinfection; (13) Retesting and Subsequent Control; (14) Regulations—State and Federal.

We also direct attention to a résumé *On the Control and Eradication of Glanders*, presented at the request of this special committee, published in this issue of the REVIEW on page 72. In addition to which, many papers were presented by individual members, of the highest character; dealing authoritatively with glanders from every point of view.

The scope of the work of this committee suggests the manner in which all the vital questions have been studied. The commission appointed by President Rutherford at the Chicago meeting four years ago on the Control of Bovine Tuberculosis, the personnel of which was published in the REVIEW at that time, and their accomplishments in the first year, are matters of history. That commission, with slight changes in its personnel from year to year, is still retained and doing excellent work. Other prominent members, both in connection with committees and as individuals, who have devoted a considerable amount of their life and energy to other contagious diseases that materially affect the commerce of our country, presented equally well-prepared papers on such conditions as Hog Cholera, Chicken-pox, Contagious Abortion, Dourine, etc. And so we might enumerate many more examples of the advanced methods of presenting medical facts and conducting the affairs of the association at our annual conventions that we are sure would commend themselves to the founders of the association, and make them feel very happy indeed at the manner in which their work had been extended during the past fifty years in which it has been left in the keeping of their followers and successors, and make them feel fully confident as to

its future in the second half century upon which we are entering; but will content ourselves for the present in voicing the sentiment of the whole profession, by thanking God, from whom all blessings flow, for the greatest blessing that could have fallen upon the American veterinary profession, the Golden Legacy, in the form of a working plan upon which to build our professional edifice, conceived and executed by the little band of loyal members of our calling in its early history in this country. Not forgetting the principles upon which they organized, as expressed in the motto which they adopted at the time and exemplified in their works—*Non Nobis Solum*, not for us alone.

ALUMNI ASSOCIATION TO BE REORGANIZED.—President Chase, of the Alumni Association of the New York-American Veterinary College, which by an act of the legislature became a state institution in May last, called a meeting of the alumni (which includes graduates from the New York College of Veterinary Surgeons, the American Veterinary College and the New York-American Veterinary College) at the Hotel Astor during the session of the A. V. M. A. the first week in September, with the object of reorganizing the association in the near future. Nearly fifty members from amongst the attendance at the A. V. M. A. responded to the call, and an interesting session was held. The history of the school, it was thought, would be of interest to the alumni, and members present were asked to furnish, as far as possible, data on the life-work of members of their classes to the secretary. With the object of assisting the officers and members of this association in carrying out their plans to a successful end, we urge upon every alumnus of the New York College of Veterinary Surgeons, the American Veterinary College and the New York-American Veterinary College to furnish to the secretary, Dr. Percival K. Nichols, 107 Harrison avenue, Port Richmond, New York, all the information they possess about any members of their class, as well as of themselves; such as whether engaged in general practice, city, state or federal work, teaching at agricultural or veterinary colleges, etc., etc. Just a little trouble on the part of each one, will be of an immense amount of assistance to the officers of the association, and the production of such an historical sketch of the accomplishments of the school through its alumni since 1857 will be extremely interesting and instructive.

ORIGINAL ARTICLES.

THE SURGICAL TREATMENT OF COLICS IN ANIMALS.*

BY L. A. MERILLAT, CHICAGO, ILL.

INTRODUCTORY REMARKS.

I am using this title, for want of a better one, to present a brief review of the available forms of instrumentation useful in the management of gastric and intestinal obstructions of animals, and I trust you will not be deceived by this startling headline. "The surgical treatment of colics" might easily be mistaken for more than I shall be able to disclose as rational treatment of a surgical character for intestinal and gastric ailments. Let me therefore first announce that this epitome is not a startling proclamation about the invasion of intestinal diseases through the abdominal wall. On the contrary, as Prof. Hobday† has told you, and as you have been warned by Dr. Blattenberg, we are not today and probably never shall be able to invade the abdominal viscera to any great extent.

One of my objects is to draw your attention to the necessity of diagnosing abdominal diseases with more certainty at an early stage in order that we may attack them with a therapy directed precisely at the affected spot. Colic, I dare say, in veterinary practice is too frequently treated as such. I have often thought if the word "colic" had never entered our nosology we would then have approached abdominal pain with a more searching inquiry as to the nature or causative condition and then we would all of these years have been treating causes instead of eternally seeking a medicant to cure the effect. Colic in animals has usually been considered as a mild or overwhelming abdominal pain as

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association at New York, September, 1913.

† See article published in this issue, beginning on page 47.

the case may be, and too little attention has been paid to the underlying cause. Our weakest point in the management of colics is our inability to diagnose the cause and seat of the obstruction at a stage early enough to put direct, effectual treatment into operation before it is too late.

The conventional treatment of most all colics is the administration of a pain-killing potion, and then if this is not followed by a cessation of the pain an evacuant is thought necessary. When these two things fail the patient dies. The pain-killing dopes are usually morphia, cannabis Indica or chloral, and the evacuant anything from a violent hypodermic injection of eserine, arecoline or pilocarpine to a large drench of linseed or castor oil. And, yes, when there is bloating carminatives and antiferments are given, and if the bloat is threatening, a trocar and canula is thrust into the right flank. These presents, with a few variations in the selection of drugs, constitute our standard treatment of colics to-day, and these treatments are so strictly conventional that almost any one of ordinary intelligence could master the entire system after a few days of instruction. In fact we all know of handy fellows in veterinary hospitals and large establishments who manage colics quite up to the prevailing standards.

Now, gentlemen, this is not as it should be at this day of sane therapeutics. We should now accept the burden of studying observations on our patients sick with abdominal diseases with a view of determining the exact nature of the condition responsible for the pain. Post mortem after post mortem held on animals dead from colics show too often how wide of the mark our treatment had been and how useless were our efforts to turn the tide toward a recovery if we did succeed at a late stage to discover the cause. Very often these post mortem investigations show that a vigorous attack at the affected spot right from the beginning might have been effective. By exclusion we do sometimes, after a patient has suffered for some time, make a correct diagnosis, but then it is usually too late to effect a cure. In short, the cases are already beyond hope and out of reach of any treatment when the diagnosis is made.

The better management of abdominal diseases must come through an intensive study of symptoms and groups of symptoms coupled with probable cause which will enable us to determine early in the march of the disease the exact seat and the exact nature of the trouble.

Abdominal Pains Misleading: Abdominal pains are, to say the least, very misleading, I must admit. Even in human beings, where the symptoms are subjective, grave errors are often made by the treachery of pain. For example, an appendicitis patient may complain of pain in the left loin or over the solar plexus. The location of pain, in fact, gives no assurance that the lesion is at the same point. So misleading are these expressed manifestations that only the specialist seems able to properly interpret them. In animal patients we may actually be thankful to be rid of this group of subjective symptoms. In truth we are at no loss whatever in diagnosing the seat of abdominal pain for want of them. I am certain after many observations covering a good many years amongst animals sick with colics that the objective symptoms presented by animals if properly studied and if properly grouped and then coupled with the probable cause can be depended upon as fairly diagnostic of special conditions even at the early stage of painful abdominal diseases. And it is largely in this direction we must turn our attention if we would arrive at that "refinement of diagnosis" upon which all sound treatment must be based. In short, we are now face to face with the problem of differentiating pain in the alimentary canal within the abdomen in regards to the exact location of the cause. Pain in the stomach should be differentiated from pain in the colon, and that from pain in the small bowels, etc., etc., and that at a very early stage of the colic. With these difficulties out of the way the treatment of colics would at once be simplified into a more effectual attack of the actual trouble. And while I admit that perfection in making these differentiations need not be expected, it is only by developing a more inquisitive disposition toward these phenomena that we may ever hope to become sufficiently proficient to bring our treatment of intestinal obstruction up to a worthy standard of excellence.

Inspection and Palpation: And in addition to the manifestations of pain there are other valuable recourses. Inspection of the abdomen often aids materially in arriving at positive conclusions as to the seat of the trouble, and while deep abdominal pressure, depended upon so much by humans, is only of service in small animals, we have here the advantage of explorations per rectum which will yield a great wealth of diagnostic information to any one who will but practice this method of searching for abnormalities diligently. To the unskilled hand all rectal explorations are alike, while the hand of the experienced diagnostician is capable of making wonderfully accurate deductions from them. In the earlier days of my career as a practitioner I doubted the possibility of recognizing a twisted colon, but after having read positive statements from others, especially European writers, I began to become more inquisitive and finally discovered that torsion of the colon is not only easy to diagnose, but the exact direction of the twist can be determined with precision. And so it is with many other conditions if we would only search for them more often than we are in the habit of doing. The rectal and vaginal routes offer a wide field for explorations which are fruitful or useless, in accordance to the training the hand has received. The condition of the large colon, the small colon, the cæcum, the inguinal rings, the kidneys, the uterus, the ovaries can be determined by them. Impactions, growths, cysts, calculi, torsions and abscesses can be diagnosed in this manner. Why then wait for the autopsy for a diagnosis with this wide open route available during life?

Then we may take advantage of exploratory punctures and stomach catheterizations in many instances to determine more accurately the nature of alimentary disorders of an acute character.

This paper is not designed as a discourse on diagnosis, but I can not very well introduce my subject as logical without first showing the possibility of locating the seat and cause of abdominal pain with a degree of accuracy that would warrant the recommendation of treatment by instrumentation. A surgical operation is only justified when directed at a definite object, and

when this object can not be located accurately then the surgeon must leave the condition in the physician's category. On this account the following remarks deal at some length with the diagnosis of the condition the operation is intended to cure.

The Stomach: The stomach of animals is subject to the following disorders which cause acute pain:

1. Overloading of the stomach of work horses, almost universally called "Acute Indigestion" in this country.
2. Impaction of the stomach of horses.
3. Acute gastritis of horses.
4. Acute dilatation of the stomach of horses.
6. Impaction of the rumen of all ruminants.
7. Foreign bodies in the stomach of dogs and cats.
8. Foreign bodies in the rumen.

It will be noticed here that without going beyond the stomach we already find that eight definite disorders, each of which I shall endeavor to show belongs to the list of surgical diseases. Some of them may yield to medical treatment, and when of a mild type may still properly remain in the list of medical diseases, but when they are grave the aid of the surgeon must be enlisted or the patient will not survive. Let us analyze them separately:

Overloading of the Stomach of Work Horses: Acute indigestion, so-called, is so well known to all practitioners that its symptoms need no special description here. It is so characteristic and its characteristics are so well known that there is little chance to mistake it for any other disorder. Oesophageal obstruction (choke) in the very first stage and poisoning with aconite are the only two conditions for which it might by chance be mistaken, and these are very easily excluded by a little study. The eructations of gas, the activity of the oesophagus in the cervical region, the distended abdomen which may be slight or threatening, the colicky pains of a fairly acute character, occurring in a horse after a day's work, sometimes before and sometimes after having eaten the evening meal, is a clinical picture that is at once recognized as an overloaded stomach. The volume of water and feeds are too great for the exhausted stomach to handle. Gases

pass readily from the stomach into the bowels and these too become bloated. In the more formidable cases large quantities of chyme are washed into the intestinal tract, until all of the bowels as far back as the floating colon are teeming with a fermenting process.

Treatment: Mild cases may take a favorable turn without any treatment, and will usually respond to the administration of antiferments, of which salicylic acid, recommended by Quitman, is probably the best; but when the attack is of a severe type only radical measures taken promptly will prevent a fatal termination. The radical measures to which I refer are catheterization of the stomach and puncture of the colon if bloating is threatening. Catheterization of the stomach is practiced extensively in this country, but in spite of its merits as a radical cure it has by no means been universally adopted as the standard intervention against an overloaded stomach, as it should have been long ago. Here is an operation that goes to the "fountain-head" of the trouble and without ceremony removes it from the body. To fight a stubborn fermentation in such a mass of chyme and then start the whole volume through its long course to the rectum by means of drugs seems criminal with such a splendid operation available. Those who have practiced this operation have little patience with the uncertain and slow medical treatment. Stomach catheterization not only evacuates the harmful contents but it also lowers the abdominal tension, and besides the dilution of the chyme with water controls the fermentation more effectually than any other form of antiferment treatment, and leaves what remains of the mass in a better physical condition for the intestines to handle. And often animals almost dead from acute indigestion, destined by the medical treatment to go through a prolonged agony sometimes ending in laminitis, are cured immediately and ready for work in a few hours.

The Sequels of Stomach Catheterization: The sudden evacuation of the overwhelmed viscera, particularly of several hours' duration, may be followed by *fatal shock* on resumption of the splanchnic circulation that had been dammed up by the pressure.

It may be mild or serious, according as the causes and condition of the patient chance to operate. An old subject or one systematically weak from continued hard work that has suffered two or three hours from an overloaded stomach if suddenly relieved will begin to show symptoms of collapse from one-half hour to six hours after the operation. The weakened viscera overcome by the prolonged stretching take more than their share of the blood volume, and this at the expense of the periphery. The result is shock; but this may very frequently be prevented by injecting large volumes of hot water into the stomach after the harmful contents have been removed. The sudden relief of a badly overwhelmed abdomen is a hazard at all times when this precautionary treatment is omitted.

Laminitis is of course always liable to follow such a disorder, and while catheterization of the stomach does not always prevent it we have found that the installation of alum—5 ounces—in solution as a parting step of the operation is markedly presented. In our practice stomach catheterization has even been charged with causing laminitis, but the reason we had so many cases at first is due to the fact that before we practiced stomach catheterization these bad cases died before laminitis could develop. When we began to prolong the life of these otherwise fatal cases we found that some of them fell victims to this complication. Now, alum has come to our rescue. Alum for laminitis was first given, to my knowledge, by Dr. Douglas, of New Orleans. Since he announced this remedy several years ago it has come into pretty general use in the west. I heard of it in California last winter, where at least one veterinarian administers it in doses of one pound. A third sequel is *acute dilatation* of the stomach, of which I shall speak later.

Impaction of the Stomach: Impaction of the stomach is a condition I fear veterinarians have too frequently failed to recognize. It is invariably referred to as senile trouble in our literature and is usually attributed to chronic dilatation of the stomach and in animals fed exclusively upon a dry fibrous forage.

While such is often the case under which the disease is en-

countered it is by no means limited to old animals. We have found numerous grave impactions in young, vigorous horses with great frequency. Straw, hay, shredded fodder, coarse ensilage, alfalfa or even clover hay, partaken of ravenously, is the usual cause. The cases in our urban practice are found chiefly amongst horses in small establishments where the food is carelessly or irradically allowed, that is, a spare ration to-day and a liberal one to-morrow. In short, the hungry horse after a day or two of hard work and privation, suddenly given access to a full manger is found sick with colic the following morning or falls sick in the harness during the next day.

The symptoms of this affection are characteristic. The pains are fairly acute, and as the patient finds no comfort in the recumbent position, it is continually up and down. There is always a marked perspiration about the neck and shoulders. The respirations are short and the nostrils widely dilated. Sometimes there is a grunt heard in the exhalations, particularly while the patient is recumbent. The absence of abdominal distensions to account for this distressed respiration is in fact pathognomic when coupled with the above symptoms. There may be some bloating of the right flank that becomes more pronounced as the disease progresses. But the bloating is never sufficient to account for the grave condition of the patient, and only momentary relief is afforded when it is evacuated with the trocar and canula.

Treatment: Allowed to run its course or under the usual medical treatment usually administered for colics, impaction of the stomach runs rapidly toward a fatal ending. Especially eserine by further exhausting the stomach in the futile contractions to expel its contents is always disastrous, and so with any of the powerful drugs resorted to for serious colics. Oil and purgatives afford no relief whatever.

The only remedy I have found to turn these fatal cases toward recovery is to patiently liquefy the impacted mass and endeavor to aspirate it out through the tube. The operation requires patience, as this feat cannot be immediately accomplished. The injections of two to three gallons of water into the already full

stomach may actually increase the patient's agony, but after a long time, when the water has had time to distribute itself through the mass the injection of additional quantities of water will begin to bring out food particles in the reflux and finally, as the softening process continues, more will flow out. After patient attempt without success, a second or third attempt may be made at intervals of an hour. As much as forty to fifty pounds of solids may thus be removed from the stomach and place an otherwise fatal case toward recovery.

Such patients are, however, invalids for some time, and are subject to subsequent attacks of colic, probably due to chronic dilatation.

Acute Gastritis: Acute gastritis is the most severe as well as the most fatal of colics if not promptly recognized and relieved. It is seen under two distinct circumstances. First, after a hard day's work or long tiresome journey; and secondly, after eating tainted food. Sometimes these causes operate together. Ground feeds containing poor qualities of corn, oats, barley and mill feed are responsible in many cases, particularly when there is a sudden change to these feeds.

The patient is stricken on the road or soon after having reached the stable, and always before having eaten the evening meal. The patient suffers horrible agony and cannot be controlled, thrashing about in a terrifying manner. There is usually a threatening abdominal bloat that calls for immediate relief from the trocar and canula. This operation gives only a momentary comfort. Belching is not a constant symptom, although there is generally a perceptible activity of fluids in the œsophagus. The respirations are accelerated, the nostrils dilated, the body bathed in perspiration, the temperature is already elevated to 104 or 105 degrees Fahr., and the mucus membranes are highly injected. In hot weather the body temperature is sometimes very high, as this disorder may be associated with overheating of the body.

Treatment: The pathognomic symptom is found in the course of the treatment, which consists of the prompt washing out of the stomach with the stomach tube and pipe. The contents

which usually flow out as soon as the tube reaches the cardiac orifice are blood-stained with the exudates from the inflamed mucus membrane. It is sour and flows out in sufficient quantity to afford an immediate relief. As the tube enters the stomach the patient, until then in great agony, immediately stands quiet. The volume of solids evacuated from such a stomach is always small and can in no way account for the patient's agony. The agony is the agony of inflammation and not entirely of engorgement, as in acute indigestion. The stomach should be well washed out by alternate installation and aspiration of hot water until the reflux is clear, and then several gallons of hot water are injected to fill the stomach against a too sudden reaction of the gastric circulation. In these cases we also use alum solution to prevent laminitis. One-half to a grain of strychnia is helpful, and in twenty-four hours a small dose of oil of linseed is given to prevent the constipation that may follow two days hence.

Acute Dilatation of the Stomach: Acute dilatation of the stomach is a sequel of the above disorders and is due to an exhaustion of the muscularis from the severe and especially prolonged stretching to which the stomach was subjected. In some instances the walls give way to the stretching and rupture occurs. Dilatations follow stomach colics in which there is little or no bloating in the bowels or when the bloat in the bowels is suddenly relieved by evacuation of the gases with the trocar and canula. As long as the stomach is pressed upon by bloated bowels its walls are supported against stretching or rupture, but when bloat is absent or is relieved, it distends in a backward direction and either stretches into a serious dilatation or else gives way entirely. It is therefore important in treating overwhelmed stomachs to relieve the distention by catheterization and then if necessary attend to the gases in the large bowels. To reverse these operations is a hazard.

Every bad case of acute indigestion, impaction and gastritis is followed by more or less dilatation with which the surgeon in charge should reckon. If the vigorous subject is given prompt treatment of the proper kind, the stretched organ almost imme-

diately resumes its normal state and is ready to functionate in the normal manner; in others the reaction requires several days and in some it runs rapidly to a fatal end or leaves the stomach a prey to frequent attacks and a victim of chronic indigestion.

In order that I may not be misunderstood, I should mention here that we use the phrase "dilatation of the stomach" to designate exclusively the stretched stomach that does not immediately contract after the material and gorging has been removed. The term is used, notably by Hutyra & Marek, as synonymous with engorgement of the stomach whether the organ is damaged by the stretching or not, while here I am restricting its meaning to the more or less permanent damage done by the stretching. That is, dilatation of the stomach is that state in which the muscularis does not contract back to a normal state when the bloat is relieved.

The symptoms of dilatation vary from a delayed return of the patient's health after an attack of colic lasting several days in the mild case, to the gravest symptoms of fatal shock in the severe one. A bad case of dilatation of the stomach following a severe stomach colic presents all of the symptoms of a rupture of the stomach. There may be free vomition and the peripheral coldness, cold perspiration, running down pulse rate, empty arteries, labored breathing and tremors about the shoulders and flanks combine to bring about a clinical picture that all practitioners recognize as signs of approaching death.

Treatment: The prevention of dilatations is found in the prompt relief of gastric colics by catheterization. It is also important to avoid a too sudden evacuation of colonic bloat when the stomach is overwhelmed. This is a fine point in the treatment of colics I would like to impress upon my audience. And lastly, the stomach, after having been relieved of its harmful contents, should be refilled with hot water. These recommendations are particularly essential in stomach colics of old horses and in those of some hours' duration.

Weak solutions of aromatic spirits of ammonia instilled into the stomach as a parting treatment is beneficial to the weakened circulation, strychnia subdermally is helpful, and warm clothing, body frictions and sinapisms cannot be overdone.

Overloading of the Rumen: Acute bloat of ruminants is one of the commonest of strictly surgical diseases of animals. It occurs with great frequency in cattle and sheep in this country, and is due usually to the rapid ingestion of gas-forming feeds, such as green clover. The hazard of turning a hungry herd into a clover pasture is well known to all veterinarians and experienced stockmen, but green corn or any green exuberant pasture may cause it. Amongst city cows we find its cause is usually the ingestions of tainted feed, garbage, etc. The disorder may run a rapid course and end fatally in a few hours or take a less acute course and last several days when the formation of gases is not so rapid. In the most acute forms bloated carcasses of animals are sometimes found in the pasture as the first evidence of trouble, and as a rule animals are dead or hopeless before a veterinarian can come to their relief.

In the acute form rumenotomy is the only practical procedure. The trocar and canula thrust into the left flank does not always effect a satisfactory evacuation of the gases because of the semi-solid character of the contents. A large opening made with a scalpel, through and through without ceremony, is justifiable when death from asphyxiation threatens. When the immediate danger is thus despatched, then a more painstaking operation may be performed.

In the milder attacks where the gases are separated from the solid contents, the trocar and the canula afford a relief promptly enough.

(Concluded in November issue.)

DR. CHARLES ALEXANDER KEHR MARRIED.—Dr. Charles A. Kehr, Hopewell Junction, N. Y., graduate of the New York-American Veterinary College, class of 1908, was married on September 24th to Miss Louisa Dorothea Strothoff, of Poughquag, N. Y. After an extended honeymoon the young couple will be at home at Hopewell Junction, where Dr. Kehr has built up a large practice, after November 1st.

DR. D. F. LUCKEY has returned to Columbia, Mo., to the office of State Veterinarian.

IMMUNIZATION TESTS WITH GLANDERS VACCINE.*

By JOHN R. MOHLER AND ADOLPH EICHHORN, PATHOLOGICAL DIVISION,
B. A. I., DEPARTMENT OF AGRICULTURE.

Among the diseases of horses with which the veterinary authorities are concerned, glanders is probably the most important, and unless strict measures for its control are enforced, the tendency of the disease is to spread more or less rapidly. This fact is due to the character of the disease, to the prevailing methods of caring for horses and, probably more important than all, to the frequent latent existence of the disease in apparently healthy animals. The destruction of all infected animals has been accepted as a matter of course in all civilized countries, and owing to the dangerous character of the disease and the possibility of transmission to man, this action appears to be the sanest and most reasonable procedure in its control. On the other hand, the possibility of a method of immunization of healthy animals is worthy of consideration and would be of a wonderful advantage.

Ever since the discovery of mallein as a diagnostic agent for glanders, experiments have been conducted by various investigators relative to its immunizing and curative value. Many favorable reports have been made by veterinarians of the results obtained. On the contrary, others appear to have had no satisfaction from its use.

Since it has been proven that glanders cases may recover it is rather difficult to establish the value of the immunizing agents as to their action on the disease. Fortunately, we now possess means by which the presence of immune bodies can be demonstrated in the animal upon which attempts at immunization are made. With the serological tests at our command we may con-

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association, at New York, September, 1913.

trol to some extent the action of an immunizing substance and observe how long the immune bodies are present in an animal receiving immunization treatment. It is unfortunate, however, that the demonstration of immune bodies does not indicate the degree of immunity in the animals.

We may obtain in glanders immunization an agglutination value of 1 to 5,000 or over, or a complement fixation with .02 of a c.c. of serum, which may continue for a period of several months, yet this same animal which apparently is supplied with a great amount of immune bodies can be readily infected with glanders bacilli. Thus, in tests undertaken for establishing the degree of immunity against glanders in the horse, it is necessary to expose the injected animals to an infection such as occurs under natural conditions. Observations of such animals as to the clinical appearance of the disease and periodical ophthalmic tests with mallein are the methods by which the most accurate results of the immunization tests can be obtained. Serum tests in these cases are of little value, as they invariably demonstrate immune bodies or anti-bodies in the immunized animals and since even small quantities of mallein injected into a horse are sufficient to produce anti-bodies which remain for 3 or 4 weeks.

Curative results from mallein were reported by Leclainche, Hueppe, Nocard, Johne and Wladimiroff, while its immunizing value against glanders was studied by Schindelka, McFadyean and Semmer, but the results were unsatisfactory. Taking into consideration the bibliography at our command and drawing conclusions from the results obtained it appears that mallein possesses very little immunizing value, and no great benefit can be expected from its use as a curative agent.

Other investigators attempted to immunize horses and other animals against glanders with the use of killed glanders bacilli, and the literature contains some favorable results from this method of immunization. The preparations which were employed for this purpose were in most instances suspensions of glanders bacilli killed by heat. Of the various products which have been prepared and are at the present time used to a limited

extent for the immunization of glanders "Farase," so termed by Levy, Blumenthal and Marxer, gives apparently the best results. It is prepared by killing glanders bacilli with 80 per cent. glycerin or 10 per cent. urea. The bacilli are then dried and the substance is used in that condition for the immunization and does not contain living bacteria. Favorable results were obtained with Farase by Machodin and Bautz and Dediulin. The results of Dediulin are probably the most remarkable, since he reports that on an estate where previous to immunization 276 glandered animals had been destroyed, he injected 303 animals, and after 1 year and 4 months not a single case of glanders developed, although in the meanwhile 14 cases of glanders developed among 300 non-immunized animals.

Machodin and Bautz subjected Farase to various tests to establish its immunizing value. Their results on guinea pigs, cats and horses were very satisfactory. Guinea pigs which were given two injections of Farase resisted six weeks later an intraperitoneal infection with 1/2500 and 1/5000 mg. of glanders bacilli. Of six horses which received two immunizing injections of Farase, two were given 1/2500 mg. of glanders bacilli subcutaneously, two received 1/500 mg. of glanders bacilli per os, and two were exposed with the other animals 45 days after the second injection. For each of the groups one check was used.

Post-mortem examination of the check animals 4 to 5 weeks after the infection showed typical glanders, while the two immunized animals which received subcutaneous injections of glanders bacilli failed to show any lesions of the disease. No record was obtained of the four remaining immunized animals, as they were turned over to another laboratory for study of the duration of immunity in these horses.

One of the recent works on the immunization of glanders was published by Zurkan who studied the formation of specific anti-bodies in the blood of horses under the action of glanders antigens. He concludes that of various antigens such as Farase, killed glanders bacilli, mallein and malleo-aggressin, Farase and malleo-aggressin proved most active in the production of im-

TABLE
Immunization Tests with Glanders

No. Group.	Guinea Pigs.	Date of First Vaccination. ¹	Amounts Injected. ²			Date of Injection.
1	1	19-V-1913	0.1 c.c.	0.3 c.c.	0.5 c.c.	10-VI-13
	2	19-V-1913	0.1 c.c.	0.3 c.c.	0.5 c.c.	17-VI-13
	3	19-V-1913	0.1 c.c.	0.3 c.c.	0.5 c.c.	24-VI-13
	4	19-V-1913	0.1 c.c.	0.3 c.c.	0.5 c.c.	1-VII-13
2	1	19-V-1913	0.3 c.c.	0.5 c.c.	0.8 c.c.	10-VI-13
	2	19-V-1913	0.3 c.c.	0.5 c.c.	0.8 c.c.	17-VI-13
	3	19-V-1913	0.3 c.c.	0.5 c.c.	0.8 c.c.	24-VI-13
	4	19-V-1913	0.3 c.c.	0.5 c.c.	0.8 c.c.	1-VII-13
3	1	19-V-1913	0.6 c.c.	0.9 c.c.	1.2 c.c.	10-VI-13
	2	19-V-1913	0.6 c.c.	0.9 c.c.	1.2 c.c.	11-VI-13
	3	19-V-1913	0.6 c.c.	0.9 c.c.	1.2 c.c.	24-VI-13
	4	19-V-1913	0.6 c.c.	0.9 c.c.	1.2 c.c.	1-VII-13
4	1	19-V-1913	1. c.c.	1.5 c.c.	2. c.c.	10-VI-13
	2	19-V-1913	1. c.c.	1.5 c.c.	2. c.c.	17-VI-13
	3	19-V-1913	1. c.c.	1.5 c.c.	2. c.c.	24-VI-13
	4	19-V-1913	1. c.c.	1.5 c.c.	2. c.c.	1-VII-13
Checks	1		Not Vaccinated			10-VI-13
Checks	2		Not Vaccinated			17-VI-13
Checks	3		Not Vaccinated			24-VI-13
Checks	4		Not Vaccinated			1-VII

¹The immunizing injections were given at 7 day intervals.

²All injections were made subcutaneously.

³0.5 c.c. of suspension in 10 c.c. or 20 c.c. bouillon containing 1 loopful of surf

mune bodies. The degree of immunity in the animals was established by Zurkan from the comparative results of the serological reactions he obtained with the complement fixation, agglutination, precipitation and opsonic tests. Since there were no practical tests made on these animals, his statement that malleo-aggressin may be used for the immunization of horses against glanders cannot be accepted as conclusive.

At our last meeting of the A. V. M. A. in Indianapolis, McKellar presented his conclusions on the protective effect of glanders vaccine.

The proportion of infections in the stables where these out-

I.

Vaccine in Guinea Pigs.

Amount of Injection.*	Date of Death.	Bacteriological Results.
Dilution of Bacilli in 10 c.c. Bouillon	Died 28—VI—1913	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Died 14—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Died 28—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Killed 20—VII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Died 12—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Killed 16—VII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Killed 20—VIII—1913	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Died 13—VIII—1913	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Died 16—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Died 24—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Killed 16—VII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Killed 26—VII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Died 5—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Killed 16—VII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Died 2—VIII—1913	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Killed 20—VIII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Died 8—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Killed 28—VI—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Killed 5—VII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Died 3—VIII—1913	B. Mallein recovered.

ace growth from agar culture.

breaks occurred, as indicated by the agglutination test, is astonishing. As there is no mention made in the article of the time the agglutination tests were applied subsequent to the mallein test, it suggests that the large proportion of reactors to the agglutination test were the results of the mallein injection and not due to the presence of the infection. If this be true, then the effect of the vaccine remains indefinite, and the control of the disease must be accredited to the other precautions which were observed.

At best it will require several years before the value of any method of immunization can be satisfactorily established. The

New York City Board of Health has been conducting immunizing experiments with a vaccine prepared in their laboratory, consisting of a suspension of dried glanders bacilli. Each cubic centimeter of the suspension contains 2 mg. of dried bacilli.

Through the courtesy of Dr. William H. Park, director of the laboratory, a sufficient quantity of such vaccine was obtained for conducting a series of investigations relative to the possibility of conferring immunity to animals injected with this vaccine.

The experiments were made on guinea pigs and on horses. Twenty guinea pigs, about 600 grams in weight, were divided into four groups, four pigs of each group receiving three immunizing injections of a definite amount of vaccine at intervals of one week. The size of the doses and other details are graphically presented in Table I. After the conclusion of these vaccinations one pig from each group was subjected to infection with suspensions of glanders bacilli. These injections with infectious material were administered at various intervals. In all instances the same strain of glanders bacilli was used for the infections.

The fifth pig in each group was not vaccinated, but served as a check, receiving only a corresponding quantity of glanders bacilli. The results of the tests in guinea pigs show that not even an increased resistance was present in the vaccinated guinea pigs. It is to be regretted that in the infection of these pigs probably too large a quantity of glanders bacilli was used. On the other hand, it would appear that if there had been any immunity present in the vaccinated guinea pigs they would have manifested it by a greater resistance against the infection than the check pigs. This, however, was not the case.

In the experiments conducted on horses, 17 animals were used which were purchased on the open market. Most of the animals were aged, but otherwise in fair condition. All horses were subjected to the agglutination, complement fixation and the ophthalmic mallein tests, prior to the vaccination. All of the horses proved free from glanders on all of these tests. Since

the amount of vaccine to be injected for immunizing purposes has not been established, it was deemed advisable to employ varying quantities for the injections in the different horses, and in order to determine the resistance of the animals against infection during and after the vaccination they were subjected to exposure at different times during the investigation.

The smallest amount of the suspension used for the vaccination was the quantity recommended by the New York City Board of Health; viz., 1, 3 and 5 c.c. per injection, while the largest amount any of the horses received was 4, 8 and 12 c.c., respectively. Two of the vaccinated horses received an infection on the nasal mucosa with glanders bacilli, taken up on the end of a platinum loop, one week after the last vaccination. Both of these horses promptly developed glanders and one of them, No. 102, died of an acute form of the disease 21 days after the infection. Thus, there appeared to be no resistance or at least no increased resistance against artificial infection.

To establish the resistance of the vaccinated animals against contact infection a corral was built where all the animals, including two artificially infected glanders cases, were kept. They were fed in common feed boxes and were watered from a common trough. Only one hay rack was used for all animals. Simultaneously with this exposure a stable with three stalls was likewise used for exposing the horses. The construction of the stalls in this stable was such that the animal in the center could reach to the feed boxes of either of the horses in the side stalls. The horse placed in the center was a good, discharging case of clinical glanders, whereas the horses placed in the side stalls were either two immunized animals or two controls, all of which were given one week's exposure with this infected horse. This was accomplished by changing the horses in the two side stalls every week, and bringing in two others from the corral, so as to make the exposure as uniform as possible in all animals, including the checks. The conditions of exposure were apparently severe, yet they did not exceed the exposure which occurs in the stables of large cities, where the sanitary conditions are very poor and where

TABLE
Immunization Tests with Glanders

Horse.	Amounts and Dates of Vaccination.				Date of Exposure.
	1 c.c.	3 c.c.	5 c.c.	8 c.c.	
99	28-III-13	4-IV-13	11-IV-13	25-IV-13	16-V-13
107	28-III-13	4-IV-13	.....	.....	.....
86	28-III-13	4-IV-13	11-IV-13	25-IV-13	16-V-13
102	28-III-13	4-IV-13	11-IV-13	.....	{ Infected Apr. 18 with B. Mall. Infected Apr. 18 with B. Mall.
111	28-III-13	4-IV-13	11-IV-13	.....
110	28-III-13	4-IV-13	11-IV-13	25-IV-13	16-V-13
105	28-III-13	4-IV-13	11-IV-13	25-IV-13	16-V-13
117	2 c.c. 2-V-13	4 c.c. 9-V-13	8 c.c. 16-V-13	.....	16-V-13
118	2-V-13	9-V-13	16-V-13	.....	21-V-13
119	2-V-13	9-V-13	16-V-13	.....	18-V-13
120	2-V-13	9-V-13	16-V-13	.....	21-V-13
123	4 c.c. 20-V-13	8 c.c. 27-V-13	12 c.c. 24-VI-13	.....	20-VI-13
124	20-V-13	27-V-13	24-VI-13	.....	20-VI-13
94	Was not vaccinated			.....	16-V-13
121	Was not vaccinated				20-V-13
82	{ Infected 21-III-13 and used for exposure } to other horses				.....
122	{ Infected 22-V and used for exposure } to other horses				.....

poor light and ventilation afford a splendid opportunity for the propagation of the disease. In fact, the exposure in the corral was rather slight, since the sunlight no doubt had a destructive effect on the infection.

All animals were subjected periodically to clinical examinations, and only one of the vaccinated horses has developed signs of the disease up to the present time, although some of them have been exposed since May 16. Horse No. 99, which received four immunizing injections and was exposed to a discharging case of glanders in the stable, died 15 days after the exposure from acute broncho-pneumonia malleosa.

In order to determine whether any of the vaccinated horses

II.

Vaccine in Horses.

Ophthalmic Tests.		Postmortem.	Remarks.
July 23.	Aug. 23.		
....	....	Acute Gland-ers.	Died May 31, 1913.
....	....	Impaction.	Died April 21, 1913.
....	....	Acute Gland-ers.	Still under observation.
....	....	Acute Gland-ers.	Died May 9, 1913.
P+++	P++	.....	First clinical symptoms of glanders ap- peared April 23, 1913. Still under observation.
—	—	Showed no le- sions of glanders.	Killed August 20, 1913. No clinical signs of glanders.
P+++	P++	Lungs showed typical gland- ers nodules.	Killed August 20. No clinical signs.
P+++	P++	.....	Still under observation.
P+++	P++	Lungs showed nume rous glanders no- dules.	Killed August 20, 1913. No clinical signs of glanders.
—	—	.....	Still under observation.
—	—	No lesions of glanders.	Killed August 20, 1913. No clinical signs of glanders.
P+	P+	Lungs showed nume rous typical gland- ers nodules.	Killed August 20, 1913. No clinical signs of glanders.
P+++	P+++	.....	Still under observation.
P+++	P+++	.....	First clinical symptoms of glanders ap- peared March 26, and continued to progress.
P+++	P++	.....	First clinical symptoms of glanders ap- peared May 26, 1913, and continued to progress.

were infected with the latent form of the disease, all were sub-
jected July 23 to the ophthalmic test. This gave surprising re-
sults. Two of the vaccinated animals gave a marked reaction
(P+++). A similar reaction was also obtained in the affected
horses used for exposure, while of the two check animals which
were not vaccinated, but had been exposed to a similar extent
as the vaccinated animals, only one responded to the eye test;
the other check animal failed to give any reaction. One month
later all horses in the experiment were again subjected to the
ophthalmic test. The results were the same as on the previous
test. At this time it was noted that the intensity of the reaction
was not as pronounced as in the first test. The inflammation

and amount of purulent discharge were somewhat less than in the previous test. This observation coincides with that of Meyer, who states that after several eye tests in positive cases of glanders the degree of the reaction becomes less distinct.

The detailed account of the results of the immunizing tests in horses is given in Table II.

In order to study the effect of the immunizing injections on the serum tests, the blood of the horses in this experiment was subject to the agglutination and complement-fixation tests from the time of the first injection until the conclusion of the work. It was found that the agglutination value of the serum of the

TABLE
Serum Reactions in Normal Horses Following the

Horse No.		Jan. 31, 3 days.	Feb. 3, 6 days.	Feb. 6, 9 days.	Feb. 9, 12 days.	Feb. 13, 20 days.	Feb. 17, 20 days.	Feb. 20, 23 days.
96	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2
	{ Agg.	1:500—	1:800	1:800	1:800	S ₁ + ½ +	S ₁ + S ₁ +	— 1:600
98	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2
	{ Agg.	1:800	1:2000	1:1500	1:1500	1:2000	1:2000	¾ + ¾ +
102	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2
	{ Agg.	1:600	1:1000	1:1000	1:1000	1:1000	1:800	1:1000
103	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2
	{ Agg.	1:500—	1:800	1:1000	1:1000	1:800	1:800	¾ + ¾ +
107	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2
	{ Agg.	1:800	1:100	1:1500	1:1500	1:2000	1:1500	1:1500

Horses 96, 98 and 103 Receive a Second

Horse No.		Mar. 31, 3 days.	Apr. 3, 6 days.	Apr. 7, 10 days.	Apr. 10, 13 days.	Apr. 14, 17 days.	Apr. 17, 20 days.	Apr. 21, 24 days.
96	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2
	{ Agg.	1:500—	S ₁ + S ₁ +	S ₁ + S ₁ +	½ + ½ +	S ₁ + S ₁ +	S ₁ + S ₁ +	— 1:600
98	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2
	{ Agg.	1:800	1:1500	1:2000	1:2000	1:1500	1:1500	1:1500
103	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2
	{ Agg.	1:600	½ + +	+ + +	+ + +	+ + +	+ + +	+ + +

Quantities of serum employed in complement-fixation tests 0.1 c.c. and 0.2 c.c.

Fractions represent the approximate degree of fixation as compared with complete fixation; S₁ + Six dilutions of sera employed in agglutination test; 1:500, 1:600, 1:800, 1:1000, 1:1500 and

vaccinated horses, as a rule, increased from the third day after the first vaccination and continued to rise for a time. A decrease was again noted from 2 to 4 weeks after the last vaccination and appeared practically normal after 6 weeks to 2 months. A complement fixation with the sera of the vaccinated horses was obtained from the seventh to the ninth day after the first vaccination and they continued to give positive fixations from two to three months after the last vaccination.

These serological results appeared only in the animals which gave no reaction to the ophthalmic test, while the blood of those vaccinated horses which gave a positive reaction to the eye test

III.

Subcutaneous Injection of 1 c.c. of Mallein.

Feb. 23, 26 days.	Feb. 27, 30 days.	Mar. 3, 34 days.	Mar. 6, 37 days.	Mar. 10, 41 days.	Mar. 13, 44 days.	Mar. 17, 48 days.	Mar. 21, 52 days.	Mar. 24, 55 days.
$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$
$\frac{.1}{\frac{3}{4} + \frac{3}{4} +}$ $\frac{.2}{1:2000}$	$\frac{.1}{S_1 + \frac{1}{2} +}$ $\frac{.2}{1:1500}$	$\frac{.1}{S_1 + \frac{1}{4} +}$ $\frac{.2}{1:1000}$	$\frac{.1}{S_1 + \frac{1}{4} +}$ $\frac{.2}{1:1000}$	$\frac{.1}{S_1 + \frac{1}{2} +}$ $\frac{.2}{1:1000}$	$\frac{.1}{S_1 + S_1 +}$ $\frac{.2}{1:800}$	$\frac{.1}{S_1 + S_1 +}$ $\frac{.2}{1:800}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$
$\frac{.1}{1:800}$ $\frac{.2}{—}$	$\frac{.1}{1:800}$ $\frac{.2}{—}$	$\frac{.1}{1:600}$ $\frac{.2}{—}$	$\frac{.1}{1:800}$ $\frac{.2}{—}$	$\frac{.1}{1:600}$ $\frac{.2}{—}$	$\frac{.1}{1:600}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$
$\frac{.1}{\frac{3}{4} + \frac{3}{4} +}$ $\frac{.2}{1:500}$	$\frac{.1}{\frac{1}{2} + \frac{3}{4} +}$ $\frac{.2}{1:500}$	$\frac{.1}{\frac{1}{2} + \frac{3}{4} +}$ $\frac{.2}{1:500}$	$\frac{.1}{\frac{1}{2} + \frac{3}{4} +}$ $\frac{.2}{1:500}$	$\frac{.1}{S_1 + \frac{1}{2} +}$ $\frac{.2}{1:500}$	$\frac{.1}{S_1 + \frac{1}{4} +}$ $\frac{.2}{1:500}$	$\frac{.1}{S_1 + S_1 +}$ $\frac{.2}{1:500}$	$\frac{.1}{— S_1 +}$ $\frac{.2}{1:500}$	$\frac{.1}{—}$ $\frac{.2}{1:500}$
$\frac{.1}{1:1000}$ $\frac{.2}{—}$	$\frac{.1}{1:1000}$ $\frac{.2}{—}$	$\frac{.1}{1:1000}$ $\frac{.2}{—}$	$\frac{.1}{1:1000}$ $\frac{.2}{—}$	$\frac{.1}{1:1000}$ $\frac{.2}{—}$	$\frac{.1}{1:800}$ $\frac{.2}{—}$	$\frac{.1}{1:800}$ $\frac{.2}{—}$	$\frac{.1}{1:800}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$

Injection of 1 c.c. of Mallein March 28, 1913.

Apr. 24, 27 days.	Apr. 28, 31 days.	May 1, 34 days.	May 5, 38 days.	May 8, 41 days.	May 12, 45 days.	May 15, 48 days.	May 19, 52 days.	May 22, 55 days.	June 2, 67 days.
$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$
$\frac{.1}{1:1000}$ $\frac{.2}{+}$	$\frac{.1}{+}$ $\frac{.2}{1:800}$	$\frac{.1}{+}$ $\frac{.2}{1:600}$	$\frac{.1}{+}$ $\frac{.2}{1:600}$	$\frac{.1}{\frac{1}{2} + \frac{3}{4} +}$ $\frac{.2}{1:600}$	$\frac{.1}{\frac{1}{2} + \frac{3}{4} +}$ $\frac{.2}{1:600}$	$\frac{.1}{\frac{1}{2} + \frac{3}{4} +}$ $\frac{.2}{1:600}$	$\frac{.1}{\frac{1}{2} + \frac{3}{4} +}$ $\frac{.2}{1:600}$	$\frac{.1}{\frac{1}{2} + \frac{1}{2} +}$ $\frac{.2}{1:500}$	$\frac{.1}{1:500}$ $\frac{.2}{—}$
$\frac{.1}{1:1000}$ $\frac{.2}{+}$	$\frac{.1}{+}$ $\frac{.2}{1:1000}$	$\frac{.1}{+}$ $\frac{.2}{1:800}$	$\frac{.1}{+}$ $\frac{.2}{1:800}$	$\frac{.1}{\frac{1}{2} + \frac{3}{4} +}$ $\frac{.2}{1:800}$	$\frac{.1}{\frac{1}{2} + \frac{3}{4} +}$ $\frac{.2}{1:800}$	$\frac{.1}{\frac{1}{2} + \frac{3}{4} +}$ $\frac{.2}{1:800}$	$\frac{.1}{\frac{1}{2} + \frac{1}{2} +}$ $\frac{.2}{1:600}$	$\frac{.1}{\frac{1}{2} + \frac{1}{2} +}$ $\frac{.2}{1:500}$	$\frac{.1}{—}$ $\frac{.2}{1:500}$

indicates slight fixation.

1:2000.

continued to give a positive fixation until they had been destroyed and proved to be affected with the disease. The same condition was observed in the animals which had been artificially infected with glanders.

The serological results from these investigations appear to

TABLE
Serum Reactions in Horses

Horse.	Vaccination Period.	Agglutination.							
		During Vaccination Period.			After Vaccination.				
		At First Vaccination.	2d Week.	4th Week.	2d Week.	4th Week.	6th Week.	8th Week.	12th Week.
99	$\left\{ \begin{array}{l} 28\text{--III--13} \\ \text{to} \\ 25\text{--IV--13} \end{array} \right\}$	1:400—	1:2000+	1:2000+	1:2000+	.....	.....	.....	.....
86	$\left\{ \begin{array}{l} 28\text{--III--13} \\ \text{to} \\ 25\text{--IV--13} \end{array} \right\}$	1:400—	1:2000+	1:2000+	1:1500	1:1000	1:800	1:400—	1:400—
110	$\left\{ \begin{array}{l} 28\text{--III--13} \\ \text{to} \\ 25\text{--IV--13} \end{array} \right\}$	1:400—	1:1500	1:2000+	1:2000+	1:1000	1:400—	1:400—	1:400—
105	$\left\{ \begin{array}{l} 28\text{--III--13} \\ \text{to} \\ 25\text{--IV--13} \end{array} \right\}$	1:400	1:2000	1:2000+	1:2000+	1:1500	1:800	1:2000	1:2000+
117	$\left\{ \begin{array}{l} 2\text{--V--13} \\ \text{to} \\ 16\text{--V--13} \end{array} \right\}$	1:400—	1:2000	1:2000+	1:2000+	1:1000	1:400	1:400—	1:400—
118	$\left\{ \begin{array}{l} 2\text{--V--13} \\ \text{to} \\ 16\text{--V--13} \end{array} \right\}$	1:400	1:2000	1:2000+	1:1500	1:1500	1:800	1:1500	1:2000
119	$\left\{ \begin{array}{l} 2\text{--V--13} \\ \text{to} \\ 16\text{--V--13} \end{array} \right\}$	1:400	1:1500	1:2000+	1:1500	1:1000	1:400	1:400—	1:400—
120	$\left\{ \begin{array}{l} 2\text{--V--13} \\ \text{to} \\ 16\text{--V--13} \end{array} \right\}$	1:400	1:2000	1:2000+	1:2000+	1:1500	1:800	1:400	1:400
123	$\left\{ \begin{array}{l} 20\text{--V--13} \\ \text{to} \\ 24\text{--VI--13} \end{array} \right\}$	1:400	1:2000	1:2000+	1:2000	1:1500	1:1000	.....	1:400
124	$\left\{ \begin{array}{l} 20\text{--V--13} \\ \text{to} \\ 24\text{--VI--13} \end{array} \right\}$	1:400	1:1500	1:2000	1:2000	1:1500	1:800	.....	1:400
94	Unvaccinated check infected by exposure	Before Exposure. 1:400—	After Exposure. 1:400	1:800	1:1500	1:2000	1:1500	1:800	1:1000
121	Unvaccinated check remained healthy	Before Exposure. 1:400	After Exposure. 1:400	1:400	1:400	1:400	1:400	1:400	1:400

have a great significance with reference to the immunity produced by the injection of dead glanders bacilli. The fact that the demonstration of the presence of immune bodies in the vaccination horses ceased entirely in two or three months from the last vaccinated would indicate that after the lapse of such a time

IV. *Vaccinated Against Glanders.*

Complement Fixation with 0.1 and 0.2 of Serum.								Remarks.
During Vaccination Period.			After Vaccination.					
At First Vaccination.	2d Week.	4th Week.	3d Week.	6th Week.	8th Week.	10th Week.	12th Week.	
—	+	+	+	..	..	..	..	Died May 31 from acute glanders and influenza.
—	+	+	—	—	—	—	—
..	+	+	+	+	..	..	..	Still under observation.
—	+	+	+	+	+	+	+	Postmortem showed pulmonary glanders.
—	+	+	+	—	—	—	—	Still under observation.
—	+	+	+	+	+	+	+	Postmortem showed pulmonary glanders.
—	+	+	+	+	+	+	—	Still under observation.
—	+	+	+	+	—	—	—	Postmortem showed no signs of glanders.
—	+	+	+	+	..	..	—	Still under observation.
—	+	+	+	—	..	..	—	Postmortem showed no signs of glanders.
Before Exposure.	After Exposure.							
—	—	+	+	+	+	+	+	Postmortem showed pulmonary glanders.
Before Exposure.	After Exposure.							
—	—	—	—	—	—	—	—	Still under observation.

the animals have very little or no immunity against the disease. This is further substantiated also by the agglutination value of the sera returning to the normal level. As a matter of fact, previous investigations carried out by Dr. Buck, of this laboratory, showed that one or two subcutaneous injections of mallein will give a complement fixation which may last from 1 to 2 months. The agglutination value of the serum of such animals is also markedly influenced by subcutaneous malleinization. The serum reaction of horses following the subcutaneous injections of mallein is given in detail in Table III. Thus it seems that a mallein injection has almost the same action on the production of immune bodies in a horse as killed glanders bacilli. Table IV. indicates the results obtained with the agglutination and complement-fixation tests in the animals used in this investigation.

On August 20, two vaccinated horses as well as one check animal, which gave positive results to the eye test, were destroyed, and in all three animals marked pulmonary glanders was observed. Horse No. 105 showed the presence of glanders nodules in the lungs in very great numbers, some of which were of the size of a walnut. In the two other cases, while the nodules were very numerous and from their appearance appeared to be active, they were of smaller sizes ranging from a pin-head to the size of a pea. Horses Nos. 110, 120 and 124 were killed on the same day, although they had failed to show any indication of glanders by the eye test, which was also substantiated by the complement-fixation test with the blood of these animals. Post-mortem examination showed no signs of glanders in these animals.

All the other animals used in these experiments are still under observation, as it is deemed advisable to give them additional exposure, in order to determine whether they possess an immunity to the disease.

The results obtained by these investigations appear to be sufficient to demonstrate the unsatisfactory results of this method of immunization. Of the immunized animals, three contracted the disease from natural exposure, which is a large proportion

when it is considered that all animals were aged and kept most of the time during the exposure out of doors. On the other hand, the fact that of the two check animals only one contracted the disease is additional evidence of the moderate character of the exposure, which further suggests the ineffectiveness of the immunization. In artificial infections of the vaccinated animals they showed no resistance whatsoever, as both vaccinated horses promptly developed an acute form of the disease from touching the Schneiderian membrane with a platinum loop, which has been touched to a growth of glanders bacilli. Thus for the present it seems advisable to abstain from immunizing horses by this method, as a practice of this kind may do more harm than good. Owners having horses which are supposedly immunized would naturally become careless, thinking their animals were resistant to the disease, and thus even a better opportunity would be offered for the propagation of the disease than if the horses were not vaccinated. Furthermore the fact that the blood of vaccinated animals cannot be utilized for serum tests for 2 or 3 months after the injections is also a great disadvantage in the eradication of the disease.

As a result of this preliminary work it appears that the control and eradication of glanders must still be dependent upon the concentration of our efforts in eliminating infected horses and the adoption of proper precautions against the introduction of infected animals into stables free from the disease. By these methods the results achieved in Germany, Austria and Canada have proved very encouraging, and no doubt if executed in the same spirit in this country a marked reduction in the cases of glanders would result.

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VETERINARY COLLEGES COMPLYING WITH REQUIREMENTS OF A. V. M. A., ACCORDING TO COMMITTEE'S REPORT AT 1913 MEETING.

Alabama Polytechnic Institute—College of Vet. Medicine.
Chicago Veterinary College.
Cincinnati Veterinary College.
Colorado State College—Division of Veterinary Medicine.
George Washington University—College of Vet. Medicine.
Grand Rapids Veterinary College.
Indiana Veterinary College.
Iowa State College—Division of Veterinary Medicine.
Kansas City Veterinary College.
Kansas State Agricultural College—Veterinary Department.
McKillip Veterinary College.
Michigan Agricultural College—Dept. of Vet. Medicine.
New York State Vet. College, at New York University, N. Y.
New York State Vet. College, at Cornell University, Ithaca.
Ohio State University—College of Veterinary Medicine.
St. Joseph Vet. Coll. (Beginning with matriculation, 1911.)
San Francisco Veterinary College.
State College of Washington—Veterinary Department.
Terre Haute Veterinary College.
United States College of Veterinary Surgeons.
University of Pennsylvania—School of Veterinary Medicine.

THE REPORT OF THE TWENTY-NINTH SEMI-ANNUAL MEETING OF THE VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY reached us a few days ago, and gives the details of the meeting briefly reported in the August number of the REVIEW on page 537; and we congratulate Secretary Loblein on his promptness in getting it in the hands of the members of the organization.

THE SCOPE OF ABDOMINAL SURGERY IN ANIMALS.*

BY FREDERICK HORDAY, F.R.C.V.S., F.R.S.E., LONDON. HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING, AND HONORARY MEMBER OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.

INTRODUCTION.

Any operation which involves entrance into the abdomen of an animal is, above all others, *the* crucial test of the value of the applicability of antiseptics to surgery. Much more is it the case in an animal patient than in a human being; for the latter can be placed under such perfectly adapted and clean surroundings afterwards that if septic infection does occur it nearly always commences either before or at the time of operation; whereas in our patients we have not only this to think of, but the much greater risk of after infection from the surroundings to which we are compelled, of necessity to return them.

You all know what incomparable advantages our medical *confreres* have when operating, as compared with ourselves. Qualified assistants and nurses to hand, a warm room, or lavishly fitted operating theatre to work in, an expert anaesthetist, a profuse supply of laundry appliances, towels, cloths, etc., hot and cold water supply, a patient amenable to reason and capable of expressing gratitude, and finally a nice clean bed, with night and day attendants to see that no false step is taken which might interfere with a satisfactory sequel. Under such conditions we, too, in veterinary practice, could achieve an equal proportion of successful results, but with animals abdominal surgery must always, I fear, have its limitations. The question of the value of the patient and its practical utility afterwards have generally to be taken into account, as this settles many cases before they

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association, at New York, September, 1913.

come to operation, the shot gun or the choloroform bottle taking the place of the scalpel.

I have now had personal experience of more than 1,000 operations on horses, cattle, dogs and cats, in which it has been necessary to enter the abdomen, and it is mainly in connection with these that I desire to exchange experiences with you to-day. Ovariectomy of the pig I am leaving almost without comment, as the wonderful results in this respect which are obtained by even the common castrator, are too well known to be commented upon. It is sufficient to say that the abdomen of the horse and dog species would not stand the same rough treatment without a very large percentage of mortalities.

I propose to invite an exchange of ideas upon the successes or failures we have had in abdominal surgery under the following headings:

Simple puncture and suturing for accidental wounds.

Simple laparotomy, gut-tie, and reduction of herniæ.

Operations on the stomach and intestines.

Operations on the abdominal urinary organs.

Operations on the internal genital organs.

SIMPLE PUNCTURE.

This operation is performed for ascites, an ailment much more common in the dog and cat than in any other of the domestic animals. In so far as the operation itself is concerned, provided the usual antiseptic precautions are taken, there need be no fear of performing it, but my own experience of a permanent recovery in cases of abdominal dropsy have been very discouraging. In ascites, as a rule, the fluid returns and eventually causes the death of the patient.

Accidental wounds are met with in all animals, particularly the horse and dog, and all of us must have had experience of an abdominal wound with protrusion of intestine. In the pre-antiseptic days the majority of such animals would at once have been put away as painlessly as possible, but experience nowadays shows that such wounds are, in by far the majority of cases, well

worthy of a trial. In the horse quite a large number of observations in which bowel was visible through an abdominal wound and in which parts were sutured even some hours after the infliction of the injury, have been recorded in veterinary literature during the past few years.

LAPAROTOMY GUT-TIE. HERNIA.

Laparotomy may be performed as an exploratory measure with a view to finding out the condition of things in the interior of the abdomen and it is, of necessity, of course the preliminary step to any operation involving attention to the organs inside. It is also useful for the removal of tumors and other diseased conditions.

The hand of the operator may enter the abdomen through the abdominal muscles, through the *linea alba*, up the inguinal canal, or *per vaginam*.

Experience teaches that where it is possible, especially in small animals, the *linea alba* forms the safest and least troublesome site of entrance for an exploratory laparotomy, but at the same time the operator must be guided to some extent by the animal upon which he is working, and the position of the organ he seeks. For example, when seeking for a missing testicle in a cryptorchid horse the inguinal region is, naturally enough, the site chosen for the laparotomy, and one may either dilate the inguinal canal itself or adopt the safer method of breaking through the abdominal muscle alongside of it. Again, in removing the ovaries of vicious mares, one may gain access to them through the flank or the vagina, the latter being, however, generally admitted now to be the safest and best; and in cats experience has taught me that the flank method gives the best results because of the crouching position assumed by this beast when put into a cage. I have known adhesion of the intestine or omentum to the abdominal wall when the wound was made below, whereas with the flank incision the intestines naturally fall away from the wound and are not in direct contact with it for any length of time continuously.

The *linea alba* can be incised almost bloodlessly and the

edges of the wound lend themselves very satisfactorily to the application of sutures and to direct union.

This is not, I believe, the generally accepted opinion, and I recollect well that as a student I was always warned *not* to make my incision there and was given to understand that the wound would not heal readily and that the parts were weak. The exact opposite has, however, been my own experience after a very serious and prolonged trial in which I have incised down the centre of this part several hundreds of times.

The healing of the laparotomy wound gives, as a rule, quite a satisfactory sequel, and it is astonishing how much exploration an abdomen will stand, provided ordinary care is taken when handling the organs and that strict attention has been paid to antiseptic details.

The operation for *gut-tie* in cattle is one which comes under the heading of laparotomy and one which is frequently performed with most gratifying results.

The operation for *hernia* may conveniently be taken under the heading of laparotomy for, practically speaking, the radical operation for this condition is really only a modified laparotomy. Once the organs are returned to the abdominal cavity it needs only a convenient selection of suture methods to keep them there securely. The limitations of abdominal surgery in this condition depend mainly on two things: Some herniæ are inoperable on account of their size and the extent of the adhesions, and others on account of their position. Some ventral herniæ in horses become very large, and for this reason and on account of the risk of prolapse of the gut afterwards, if the animal is at all workable, it is sometimes wise to think twice before advising operation.

Inguinal hernia in the stallion and dog are often difficult to put right if it is desired at the same time to preserve the descended testicle on the same side. If the testis is removed the covered operation does away with a lot of this difficulty.

OPERATIONS ON THE STOMACH AND INTESTINES.

Any operation which involves cutting into the stomach or intestines of an animal is always serious, and the gravity of it

should always be explained beforehand to the owner. Such operations are usually a necessity, and the only alternative to adopt before they are discussed.

It is in regard to the horse that I particularly ask for an exchange of information. In the dog and cat no one will now deny that operations for the removal of foreign bodies from the stomach or intestine are possible, although even in them the proposer must always be guarded; and the ox will bear rumenotomy sufficiently well to make it an operation constantly resorted to by practitioners in country districts; but the exploration, after surgical incision of the stomach and intestine of the horse is as yet very decidedly in the experimental stage. Even the boldest and most enthusiastic surgeon will think twice before he suggests to an owner that the abdomen of a horse shall be opened and the twist of the intestine, which he knows to be present, shall be unravelled, or that the calculus, the position which he may perhaps be able to exactly locate, shall be removed from the intestine by laparotomy and bold incision directly upon it.

Personally, I have within the last few years twice attempted to reduce a twist of the bowel and six times have attempted removal of calculi from the horse. In each the result has been failure. I am disposed to be pessimistic over surgical interference in this animal for these two of its commonest and most painful and fatal ailments. The large bulk and weight of the organs to be manipulated, the necessity for doing it under antiseptic conditions, and the fact of one having to work in a very confined space, render the task an utterly hopeless and impossible one in the case of a twist of the bowel, and indeed the tangle into which a horse's bowel will get is most extraordinary; so much so that it is often quite an impossibility to replace the gut into its normal shape even when the bowels have been removed from the body. I have tried by laparotomy of the flank and, in the mare, *per vaginam*, and I have no hesitation in putting it down amongst the impossibilities of veterinary practice.

Laparotomy for calculus of the bowel, too, must, I fear, be

relegated to the same category, as I do not know of a single recorded case where it has been successfully done. That the healthy, small intestine will stand surgical interference has been demonstrated by several observers, but unluckily it is not in this part where we get intestinal calculi, and I found that the chief cause of failure was to be found in the fact that I was utterly unable in any of the six cases in which I operated to get the large bowel containing the calculus to the orifice of the wound. Calculi are usually lodged in the large intestine, and I have been unable up to the present to find a single recorded observation where any surgeon has been successful in removing, by incision, a stone from this part of the gut. When the stone was in the large colon I found that it was a physical impossibility to withdraw the organ through a wound of safe size for promise of satisfactory suturing afterwards, for one must not forget that the wound one makes has to remain a weak spot with a large weight of bowel pressing upon or against it for some time. The wall of the large colon, too, does not lend itself well to the application of sutures, and the extreme weight of its contents make it apt to readily rupture. The fluidity of its contents, too, make septic infection very easy.

If the stone has passed out of the large colon (and this is usually the case before a stoppage of the bowel takes place), then it becomes jammed in that comparatively narrow lumen which is attached to the lumbar region before actually becoming rectum. Here, again, it is impossible to withdraw the portion of gut so as to bring it into the orifice of a flank wound. I have tried to get at this both by flank incision and *per vaginam*, but, so far, with only failures to report. I believe this, too, to be impossible.

I do, however, believe that there is a future in front, with a prospect of success in a few cases, of the attempt to assist the calculus to move one way or the other, and to get it away from the narrow place in which it is jammed. One horse in which I did this survived for fourteen days and then died of a lung trouble quite unconnected with the original ailment. Especially do I

think so now that one knows the vaginal mucous membrane will stand puncture so well when first rendered surgically clean by antiseptics.

For a stone just a shade smaller in circumference than the bowel I feel sure that with the operator's arm in the abdominal cavity and an assistant manipulating *per rectum* it will be possible to bring the stone away. In the cases in which I tried it the concretions were large and I could not do it, so I contented myself with forcing the stone back again into the large intestine where it had plenty of room to move about and where it must have lain for some months previous to the attack of colic. The relief of the pain was immediate and well marked in each case, although, as I have already observed, none of my patients made permanent recoveries.

Bowel surgery in the horse will always, I fear, have its limitations very strictly defined. It will be a merciful boon to the equine species if someone can devise ways and means to get over the enormous difficulties in this direction.

OPERATIONS UPON THE ABDOMINAL URINARY ORGANS.

Although always to be considered seriously, I do not think we need discuss operation upon all the urinary organs as impracticable or impossible. It is in the horse and dog that surgical interference is most likely to be called for.

No one nowadays will deny the practicability of removal of stones from the bladder, and successful results in both horse and dog have frequently been recorded by numerous observers. Calculi are frequently removed from the bladder of both dog and horse and the proportion of successful results is such that when done by an expert the operation is always worth advising.

When in the kidney the difficulty lies in accurate diagnosis. Operations in the small animals are possible both for removal of stone and for removal of the whole kidney, but in the horse I believe that here again we come to one of our limitations.

OPERATIONS ON THE INTERNAL GENITAL ORGANS.

Here, above all others, may the animal surgeon claim success. The generative organs of the calf, pig and bitch, have been in-

terfered with successfully by the common castrator for many years and in the operations for oophorectomy and ovaro-hysterectomy they are very expert. The mare and cow have also received their share of attention and, provided due precautions are taken with reference to surgical cleanness, the operation for ovariectomy can also be performed upon them with an almost infinitesimal risk.

Provided scrupulous antiseptic care is taken an expert operator may remove the ovaries from the mare, cow, monkey, bitch, sow and cat almost with impunity, and the same may be said in regard to the removal of the male or female generative organs from birds; this operation now being done to quite a large extent in ostriches in South Africa. (Vide Mr. Stanley Elley's article in the *Veterinary Journal* for August of this year). In fact, it is astonishing how little notice the patient will take of this operation afterwards if even ordinary care is exercised throughout the operation and convalescence. The cat is the only one of the above patients about whom I have ever had any anxiety afterwards; cats are curious animals at all times and often refuse to feed on the slightest thing being done to them. Removal of the uterus and ovaries too, is well borne by the bitch, and the cat stands this operation quite as well as the removal of the ovaries alone. With a healthy uterus the risk in the bitch is infinitesimal, either when the ovaries alone are excised or the ovaries and uterus, either when empty or pregnant. Out of the 300 consecutive cases of most of which I have the records I have never lost but one and that was indirectly attributable to other causes and not to the operation.

The pregnant uterus can be removed successfully either before the time due for whelping or even after the act has really commenced. I speak now from an experience of more than 70 cases of this kind, and I have often been astonished at the entire absence of constitutional disturbance, provided septicæmia has not already made progress before the operation is done. Only recently I have had, in consultation with other veterinary surgeons, experience of two typical cases of this kind. One patient had been in labor for two and a half days, and five puppies had been re-

moved by the natural passage, but the sixth was retained and had remained at the top of the left horn of the uterus, this organ being much distended with septic gases. Laparotomy was performed, the whole uterus and contents were excised and the bitch has made an absolutely uninterrupted recovery. The veterinary surgeon with whom I operated in consultation wrote to say that the most noticeable feature she showed afterwards was to grumble because she had no puppies to suckle and to wander round to seek for them.

The second case I alluded to is one of a bitch with her uterus full of pus. This was carefully excised without escape of any of the contents and she, too, has never shown any constitutional disturbance whatever.

As showing, too, how little notice may be taken by an animal when strict asepsis is preserved, I recollect well one case in which a cat had her ovaries removed before her kitten was weaned, and she still continued to satisfactorily suckle it.

Cæsarean Section, in which the uterus is opened and the foetus removed, is an operation which I dread much more than the entire extirpation of the uterus and ovaries. Recorded observations, however, show that it can be done successfully even in the larger animals and in this connection I would refer you to a case recorded in the *Veterinary Journal* for May, 1906, by Mr. Turtill, in which a dead calf was successfully removed from a three year old heifer and the animal made an excellent recovery afterwards. I attempted it in a little Welsh heifer and succeeded in getting the calf away, but the heifer died on the following day.

Removal of the whole uterus in the mare or cow whilst inside the abdomen is an operation I have never had occasion to attempt nor yet do I recollect reading of its successful performance, but removal of the proalpsed uterus when projecting from the vagina has been done many times successfully in the cow, bitch and cat. The mare, I believe, usually stands this procedure very badly and rarely recovers afterwards.

SUMMARY.

Summarizing the above under the heading of my paper, I think we may truly say that the field of work in the direction of

abdominal surgery in the domesticated animals is quite a practicable and even, one might almost say, a large one. Operations involving the incision of the abdominal wall may be undertaken by every man who has had a veterinary training and the proportion of losses will be infinitesimal.

The internal generative organs bear surgical interference under certain conditions very well indeed, and surgical operations on the bladder, too, are not out of reach.

Operative interference with the interior of the intestine is always a serious matter, although even that should be attempted when no other alternative presents itself. In the smaller animals the chances of success are reasonable; in the large ones the field is much more restricted and has its limitations.

THE ESSENTIALS TO SUCCESS.

Lastly, having decided to operate, let us consider what are the essentials to success. As I said at the commencement of my paper the successful opening and closure of the abdomen is *the* crucial test of the value of the applicability of antiseptics to surgery. For any operation involving this procedure we must have *surgical cleanliness* and to gain this end we must apply ways and means to surgically clean our hands, our instruments, and that portion of the body of our patients which has to be incised.

For the instruments, cotton wool and swabs, there is no simpler or better method than to sterilize by boiling. A clean saucepan can be obtained even at a cottage, and the instruments can be taken direct from that and returned to it whenever they are set down or changed. Or, if preferred, they can be transferred after having been boiled in a solution of some non-corrosive antiseptic.

For the patient the razor must be used to remove the hair, and it will astonish those who have never tried the use of this simple, everyday instrument to see the difference between the healing of the wounds which have had their hair previously removed from the edge by shaving and those in which the precaution has been neglected. And yet, even in these antiseptic days, how few of

us consider the razor as an integral part of the operative outfit and find it a regular place in our operating case. In reality, for those who have once used it, it becomes *the* most used instrument of the whole lot.

The skin is then painted with iodised choloroform or even plain tincture of Iodine, *without being previously washed*, and this is allowed to dry on; the patient then being ready, when anaesthetised, for the incision of the scalpel.

In connection with this use of iodine it is worth while to remark here that this is the only treatment I have adopted for the skin in more than 200 consecutive cases of abdominal surgery, in preference to washing, and that I have never once had reason to regret it. Its value as a cutaneous disinfectant is astonishing, and the saving of time by its use, with the certain knowledge that it will act as desired, makes iodine one of the most useful adjuncts of the surgeon.

For dressing and attention afterwards, I used to always paint with iodoform colloid, but now I give instructions for the daily dressing of the surface surroundings with iodine, and it is a most rare occurrence not to get a primary union; the sutures being removed from five to eight days later.

The hands of the operator should be well scrubbed in hot water with ether soap and a nail brush, and scrupulous care must be taken that the hands do not again come in contact with any surgically unclean body until after the completion of the operation. The operator must not touch anything which has not been sterilized, or if he does he must take measures to again disinfect himself.

In conclusion, gentlemen, I ask each of you, in taking up the discussion, to be good enough to bring forward a few actual cases in which you have interfered with the abdomen. Failures are equally as good to learn from as successes, and one and all will help to swell the list of actual statistics from which results may be drawn to increase that knowledge we are all in search of, viz., the best and safest methods to adopt when called upon to relieve the suffering of the animal world.

APPARENT INCONSISTENCIES OF BIOLOGIC DIAGNOSTICS.*

BY R. A. ARCHIBALD, D.V.S., OAKLAND, CAL.

Many of you, in resorting to the use of biologic diagnostics for the purpose of clearing up obscurities in connection with certain diseases, have, no doubt, occasionally found that the results of such tests have failed to bear out or corroborate your clinical and post-mortem findings. As a consequence, you have undoubtedly been disappointed, and have perhaps lost faith in such tests or in the technique observed in their performance. In other words, the tendency is to assume under such conditions that biologic diagnostic tests are frequently inconsistent and unreliable. For instance, you may take a tuberculous or glanderous individual, one showing suggestive clinical symptoms, and submit him to a biologic test, and you perhaps obtain a negative reaction, not being satisfied with the result of the test, you subsequently apply a second test, and with this test you may obtain a positive reaction. Again, you may test an individual for glanders or tuberculosis with two different biological methods, and you obtain a positive reaction with one test, while the other may prove negative. Under these conditions, it would seem natural or justifiable for you to conclude that the biologic tests applied were inconsistent and unreliable, or that the technique observed in their performance was faulty. The human clinician or therapist can hardly be blamed for losing confidence in the so-called Wassermann test when from five to fifteen per cent. of syphilitic individuals fail to show a reaction at perhaps a stage of the disease when a positive diagnosis is most desirable, unless they understand the reason for such failures. The same is true with

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association at New York, September, 1913.

other biologics such as the mallein and tuberculin tests as we occasionally are presented with clinical cases of glanders and tuberculosis which fail to react to these agents.

It is our purpose to endeavor to demonstrate to your satisfaction that biologic diagnostics if properly applied are absolutely consistent, but that this consistency depends upon the condition or upon the stage of the disease through which the patient is passing at the time they are applied.

In discussing matters pertaining to biologic diagnostics we do not intend to go deeply into the various and devious ultra-scientific problems incidental thereto, we will simply aim to present the subject in as practical a manner as possible. This procedure is deemed best in view of the great diversity of opinions which exist with reference to the question of biologic reactions. Furthermore, it is not our purpose to prolong discussion along these lines beyond the bounds necessary to a proper and practical presentation of our subject.

In order to facilitate the discussion of this question, we propose to arbitrarily divide the various biologic tests into two classes. First, immune or anergic tests; and second, anaphylactic or allergic tests.

Under the head of immune tests come such reactions as the complement-fixation, agglutination, precipitation, etc. These tests depend upon the determination as to the presence or absence of immune elements in the blood of the individual to be tested.

To illustrate this more fully we will briefly describe the principles involved in some of these tests. In the study of the complement-fixation test, it is necessary to consider three elements whose presence are absolutely essential for bringing about a positive reaction, namely, antigen, amboceptor and complement. The term antigen is applied to any proteid substance that will, when injected into an animal body, give rise to the formation of hypothetical immune substances designated as amboceptors. It would appear that any proteid substance which may be introduced into the animal economy other than by the natural channel (the digestive tract) will give rise to the formation of these immune substances, amboceptors.

The function of the amboceptors, as their name indicates, is to act as a go-between the antigen and the activating substance, the complement, which is a constituent of normal blood. Antigen and amboceptors are more or less specific one for the other, the complement, however, is regarded as being non-specific. The combination of these three elements appears to be a proteolytic one, or in other words, is for the purpose of breaking up the antigenic proteid substance and changing it from complex into simpler forms for the purpose of permitting the nutritive portions to be assimilated, and for the elimination of those portions which can not be used for the purposeful end of the body cell. In fact, it is a process of parenteral digestion going on within the animal body aside from natural or eternal digestion, which takes place normally in the alimentary tract. It must be remembered that in the case of disease producing antigens, the proteolytic action results in the liberation of toxic substances which attack the body cells, causing various pathological changes, the character of which depends upon the selective nature of the specific antigen.

To illustrate, if we should inject a susceptible individual with, say, glanders bacilli, which would in this case represent the antigen, the formation of immune bodies or amboceptors specific for the glanders bacillus would be the result, so that later, if we obtain serum from said individual and add to it glanders bacilli or an extract of same, and complement obtained from the serum of a normal individual, the three substances, antigen, amboceptor and complement, will become anchored or fixed, demonstrating the presence of the amboceptors, the specific substances sought for. It can be readily understood, however, that if the serum is obtained from the inoculated individual at a time when specific amboceptors are not present in the blood serum, that is, when the individual is in an allergic stage, your test would prove negative. In such diseases as syphilis, glanders, tuberculosis, etc., we have reason to believe that there are periods in their course in which amboceptors or immune substances may or may not be present, consequently, if the test be applied during a period

when immune substances are not present, the complement-fixation test will naturally give negative results.

The condition known as immunity undoubtedly may be transient or permanent. When only transient, the power or habit on the part of the tissues or cells to produce immune substances is lost, due to the lack of sufficient stimulation by the products of the infecting agent, and as a consequence the infected individual becomes anaphylactic. This is particularly true of such diseases as tuberculosis, glanders, syphilis and other chronic infections. In these diseases, when the infecting organisms become walled off from the normal tissue, or become incapsulated, there is no destruction of bacterial cells, no liberation of endotoxic elements, no stimulation, and as a consequence immune bodies cease to be formed and disappear from the blood stream through the natural channels of elimination.

Agglutination and precipitation reactions depend upon the presence of immune substances which receive the name of agglutinins and precipitins respectively. These substances, while perhaps differing in some respects from amboceptors, still are so intimately related that it is almost impossible to separate them, and it is generally believed that they exist in an animal undergoing immunity at the same time, therefore any statement made with reference to amboceptors will also apply in a general way to these substances, consequently nothing more will be said regarding these tests at the present time.

Under the head of anaphylactic, or allergic reactions, come such tests as the mallein test for glanders, the tuberculin test for tuberculosis, the lutein test for syphilis, the Irons' test for gonococcus infection, etc. These tests are dependent upon the fact that the infected individual has become allergic or hypersensitive to the toxin of the specific infection to such an extent that when the specific toxin is brought in contact with the tissues or cells of the infected individual, injury to such tissues or cells is the result. This injury interferes with the functional activity of such tissues or cells or perhaps destroys them entirely, giving rise to the clinical manifestations that indicate a positive reaction. It matters

not whether the toxin is applied locally, as in the case of the ophthalmic or cutaneous tests, or as in the case of the subcutaneous test, the results are essentially the same, providing the individual is in an allergic condition.

Care must be used in interpreting skin reactions, however, as the skin has not only a marked affinity for foreign protein substances, but also reacts in a striking manner to various split products, and the intensity of such reactions may lead us to reach wrong conclusions as to the extent and progress of the existing pathological changes.

From our knowledge of the mallein or tuberculin tests, we know that there are occasions when an infected individual will fail to give a positive reaction, yet this fact cannot detract from the efficacy of these tests. The failure to react is simply an indication that the condition of the individual at the time the negative anaphylactic reaction is obtained is one of immunity and not one of anaphylaxis. It can also be readily understood that an infected individual may be in an allergic and in an immune condition at one and the same time. In fact, this condition is rather the rule than the exception, but it is occasionally true that only one of these conditions may exist, more especially in such chronic conditions as tuberculosis, glanders, syphilis, etc., during certain stages of their course.

It is believed that the tissues or cells of susceptible individuals do not normally possess specific affinity for toxic substances, but acquire them by association with specific infections and their toxic elements. This specific receptivity is the result of the stimulating action by specific toxins, and constitutes the stage of anaphylaxis or allergy, a condition that is present when the clinical symptoms of a disease are first manifested.

It would seem as if the symptoms of a disease arise when an amboceptor becomes concentrated sufficiently to break up the infecting organism or, in other words, when specific proteolysis begins.

The general conception of the present time is that on sensitization, immunization with protein substances, elements of the

general nature of amboceptors are formed. These are specific and their union with antigen in co-operation with complement results in the liberation of toxic substances that produce the anaphylactic symptoms and lesions and this action is regarded as one of parenteral proteid digestion.

From what has already been said it is easy to realize that while an infected individual is not in a stage of immunity such tests as the complement-fixation, agglutination or precipitation will fail to give positive results, and the same is also true that when an individual is not in an allergic or anaphylactic stage, he will not react to such tests as the mallein or tuberculin. It is a well-known fact that if we attempt to test a second time a glandered or tuberculous individual with mallein or tuberculin, before a sufficient time has elapsed following the first injection, we fail to obtain any reaction, for the reason that the first injection of toxin has produced as the result of stimulation of the body cells a condition of temporary immunity or, as sometimes referred to, a condition of anergy or anti-anaphylaxis.

Whether this refractoriness to tuberculin and mallein that develops in certain cases of tuberculosis and glanders is truly anergic is not definitely known, but it is quite evident that refractoriness may be induced by a large dose of antigen in the latter stages of incubation, nevertheless, it is a fact that the tuberculin or mallein reactions, while best developed in true tuberculosis or glanders are also obtainable by sensitization with mallein or tuberculo-proteins. Does it not seem reasonable therefore that similar conditions may naturally prevail during the course of such chronic conditions as glanders, tuberculosis or syphilis?

The study of such a disease as typhoid, which ordinarily follows a definite course, teaches us that at certain stages of the disease the application of an anaphylactic test will give positive results, while during the same stage an immune test will give negative results. It has also been taught us that a certain time must elapse subsequent to the appearance of clinical evidence of this disease before an immune test will prove efficacious. The inference from all this is to the effect that notwithstanding the

fact that you may have, for instance, a Wassermann performed on a syphilized patient to-day with negative findings, and another test applied a month or so from now with positive results, it does not mean that the laboratory technique is in error or that the test is at fault. It simply implies that at the time of the first test this patient was in an allergic condition, and subsequently became an anti-anaphylactic by acquiring immune substances in his blood.

An interesting feature of anaphylaxis and immune phenomena lies in the fact that hypersensitiveness to a foreign protein develops only when a certain period of cessation of the introduction of the substances is allowed to elapse before the next injection, which then produces the well-known symptoms. Thus continuation of inoculations at regular short intervals does not necessarily confer on the recipient of the foreign substances anaphylaxis during that period. It is, therefore, more likely to develop an anaphylactic condition in those patients who are infected with certain organisms which remain in the body for a long period of time, during which time their activity undergoes fluctuation owing to the production of certain antagonistic substances by the infected host.

The clinical course of syphilis, glanders or tuberculosis fulfil all the requirements that lead to the development of either immune or allergic conditions.

Due to lack of time, we have refrained from going into the technique of the various tests, but we wish to state that if there is any one present who desires to go into that phase of the problem, we shall be pleased to answer to the best of our ability any questions that may be propounded.

This brings us to the last and, perhaps from your point of view, the most important point of all, viz: "How the apparent inconsistencies of biologic diagnostics may be overcome."

In such a disease as glanders the problem is, comparatively speaking, easy of solution. To eliminate error in the case of such a condition as glanders it simply becomes necessary to apply simultaneously both an anaphylactic and an immune test. In

this way you are almost certain of obtaining positive results, no matter in what stage of the disease your individual may be. In view of the recent achievement of Hideyo Noguchi in successfully cultivating the spirochæta pallida, we are hoping to be able to make a positive diagnosis in any stage of syphilis. By cultivating the spirochæta pallida Noguchi has accomplished that which will probably enable the laboratorian to use a specific antigen in the performance of the complement fixation test, and will also enable the clinician to apply at the same time an anaphylactic test in the form of an extract of said organisms.

As regards biologic diagnostic tests for tuberculosis, we shall still have to pin our faith upon allergic tests for the reason that up to the present time no practical method has been evolved for determining the presence or absence of immune elements in that disease. Many laboratorians, however, are working along these lines, and it is to be sincerely hoped that the day is not far distant when a practical immune test for tuberculosis and many other obscure diseases will be found. When that day comes many of the terrors and uncertainties regarding this and other diseases that run a variable and more or less indefinite course will have been dispelled.

WEBSTER'S DICTIONARY COULD NOT SAVE LAWBREAKER.—*The Nebraska Daily Press*, of Nebraska City, recites a case of a man being tried for violating the practice act of the state of Nebraska by assuming a veterinary title and practising illegally. The defendant's attorney made a demur against the charges preferred on the ground that according to his interpretation of Webster's definition the words "Veterinary Surgeon" or "Veterinary" were not the title or analogous title referred to in the law. This was sustained by the judge. The same charges were later taken before another judge, where the same attempt to juggle with the interpretation was made, but unsuccessfully, the judge deciding that the defendant had violated the law by assuming a title to which he had no right. He then pleaded guilty, his fine and costs amounting to \$81.00.

AN IMPROVED METHOD OF MOUNTING MUSEUM SPECIMENS.*

BY L. ENOS DAY, V.S., VETERINARY INSPECTOR; IN CHARGE OF THE BRANCH
PATHOLOGICAL LABORATORY, BUREAU OF ANIMAL INDUSTRY, AT CHICAGO, ILL.

From the time that pathology was first established as a science, teachers and workers in this branch of medical science have endeavored to preserve the tissue so that the pathological changes could be demonstrated in the gross specimen. In order that the specimen may be of greatest value, the color, as well as the structure, should be preserved, as much depends upon the color in demonstrating macroscopical pathological changes. The method which preserves the color best without destroying the structure of the tissue is the one desired.

Alcohol of various strengths is probably the oldest substance used in preserving museum specimens. Its use, however, has the great disadvantage of not only shrinking the tissue but rapidly destroys the color. Some years ago we welcomed with delight the statement that formalin would meet our desires as a preservative for museum specimens. The results, as we all well know, did not meet with our wishes. While it is true that it prevents decomposition even in quite dilute solutions, it does not preserve the color and causes some shrinking and renders the tissues quite brittle, when used alone. It has, however, the advantage of being much cheaper than alcohol.

It was not until Professor Kaiserling published his method of preserving museum specimens that we were able to preserve the original color in pathological or normal tissue for any length of time. At the present time I know of no method which preserves the color and structure better than this one. Since this

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association at New York, September, 1913.

method was first published, a number of modifications have been recommended, but none of them have proven to be any special improvement over the original formula. This method has the disadvantage of being bulky, the specimens having to be placed in glass jars of various sizes which are unwieldy and awkward to handle, especially in classrooms, and occupy a great deal of space in the museum.

As the specimens become old, or if exposed to the light, they soon lose their bright color. Various molds often grow in the final preserving fluid and destroy the specimen in that way. If one wishes to ship them elsewhere for exhibition purposes there is always the great danger of breaking.

In order to overcome these objections several workers have mounted museum specimens in "Kaiserling jelly" in Petri dishes cemented to plate glass squares, the "Kaiserling jelly" being made by adding from 10 to 18 per cent. of the best grade gelatin to the Kaiserling preserving fluid, which will be referred to later.

The pioneer and probably the most successful workers with this method in this country are Watters,(1) Coplin,(2) Albert,(3) Watters.(4) Specimens mounted in this manner are easy to handle, stand shipping well and occupy but little space. They have this disadvantage, however, that the gelatin is not a clear white and becomes darker with age, and is liable to shrink either from the glass or the specimen. This, of course, detracts very materially from the appearance of the specimen.

About fifteen or twenty years ago a method for mounting museum specimens in Kaiserling's fluid between watch glasses and plain glass squares was perfected in Germany. This method has been kept a profound secret by those who perfected it. These preparations are bound in a cardboard frame covered with book-cloth, and are very neat in appearance and durable. Several years ago the writer had the pleasure of examining some of the German specimens and also some that had been prepared in Kaiserling jelly, and was at once impressed with the beautiful appearance of the former as they contained no air bubbles and

the fluid was clear and contained no color; also that the cardboard case protected the glass background from being soiled when handled. I began at once experimenting in various ways to prepare mounts in Kaiserling fluid, as it appeared to me that it was much superior to any of the various other fluids. After many attempts, I succeeded in mounting specimens under watch glasses in Kaiserling fluid. These mounts retain their color and show relations well, are easy to handle and occupy a very small amount of space, and are permanent. The greatest difficulty experienced was to find an adhesive substance that would seal the watch glass to the glass square which possessed sufficient elasticity to compensate for the expansion of the fluid during extreme changes of temperature without cracking and allowing some of the fluid to escape. Asphaltum with a melting point of about 230 degrees F. was found to meet the above requirements. I have placed mounts cemented with this substance in an incubator at a temperature of 104 degrees F. for forty-eight hours and then exposed the same mounts to a temperature as low as 5 degrees below the freezing point for twelve hours without any undesired effects.

The method which I have adopted is as follows: The tissues selected for museum mounts are washed lightly in water to remove any blood or foreign matter that might adhere to them. If the specimen is a thick mass it is cut in slices about an inch in thickness and placed in Kaiserling's fluid No. 1 until fixed through, which requires from one to several days, depending upon the size of the tissue and the amount of fluid used. It is best to use plenty of fluid. Care should be taken to place the specimen in the position that it is to assume when mounted. If this is neglected it is liable to become wrinkled and curled and can never be made to look well afterwards. If it is desired to mount thin membranes, such as pleura, mesentery, peritoneum, etc., they should be stretched over glass frames before fixing in order to prevent curling. Either glass or glazed earth earthenware jars should be used for fixing containers, as metal is liable to cause staining. As soon as the tissues are fixed through, they

are washed in running water for fifteen or twenty minutes to remove as much of the formalin as possible from the surface. They are then trimmed down to the desired size and shape to fit into the watch glass, and placed in 60 per cent. alcohol until the color begins to return, then they are placed in 95 per cent. alcohol until the color is fully restored. This step must be watched closely, for if they remain too long in alcohol they fade again. As soon as the color is properly restored they are placed in Kaiserling's preserving fluid for a day or two and then mounted. It is always desirable to mount the specimens within a few days after fixing in order to get the best results. Before mounting, the tissues are exposed to a negative pressure of about 26 inches of mercury for from half an hour to an hour and a half to remove all of the alcohol. If this is not done the alcohol which remains in the tissues produces fading.

Before using the watch glasses it is necessary to grind them perfectly level. This is done by sprinkling fine carborundum powder on a large piece of plate glass and then pouring a sufficient quantity of water on the powder to make it grind well. The grinding should be continued until the ground surface nearly equals the thickness of the glass. Watch glasses 6 inches in diameter are a very good size, but larger or smaller ones may be used, depending on the size of the specimen one wishes to mount. The glass squares should be made of plate glass $\frac{3}{32}$ of an inch thick and $7\frac{7}{8}$ inches square for the 6-inch watch glasses. The size of the square glasses should vary in proportion to the size of the watch glasses if larger or smaller ones are used. Plate glass squares thicker than $\frac{1}{4}$ of an inch are undesirable even for very large specimens requiring watch glasses $7\frac{1}{2}$ inches in diameter. After the glasses are thoroughly cleaned, the specimen to be mounted is placed in the watch glass and covered with a glass square allowing the watch glass to protrude far enough to form a lip. The fluid (Kaiserling's preserving fluid) is poured in at this opening until it runs over, then the watch glass is slipped towards the centre sufficiently to close the opening and then set aside in a perpendicular

plane to allow the air bubbles, if present, to rise, and then the process is repeated until no more bubbles rise, then moved to the centre. If a number of mounts are to be made, the specimen and glasses may be immersed in a large quantity of fluid and put in place and taken out and set aside as before. If the watch glasses have been properly ground the glasses adhere so perfectly that the fluid does not escape. After all of the bubbles have been removed, the mount is placed on a flat surface with the watch glass upwards and all moisture and greasy substances are carefully removed; then melted asphaltum which has been heated to about 250 degrees F. is poured around the joint between the two glasses. The amount of asphaltum should be liberal and should extend about $\frac{1}{2}$ inch upon the watch glass and an equal distance on the plate glass. After the asphaltum has become cool and set, it can be trimmed with a knife and the surface smoothed down with a thick-bladed knife or other metal which has been heated to nearly a red heat. After the melted surface has again become cool the mounts are set aside for a few days to determine if they have been perfectly prepared. If bubbles appear the specimen should be remounted, which is not a difficult task. The greater portion of asphaltum can be removed with a knife and the remainder with xylol or gasoline, as it is very soluble in either of these fluids. If the specimen has remained perfect it can now be enclosed in the cardboard mounting. When $7\frac{7}{8}$ -inch glass squares and 6-inch watch glasses are used the cardboards should be 8 inches square with a circular opening $5\frac{3}{8}$ inches in diameter in the centre. They should be about $\frac{1}{16}$ of an inch thick and of good quality. The upper board should be covered on the top side with bookbinders' cloth and on the under side it should have a piece of cardboard of the same size and thickness with a circular opening 7 inches in diameter glued to it, thus allowing space for the asphaltum. The cloth should extend about an inch on all sides, allowing sufficient material to paste to the ends and under side. The lower board should be just 8 inches square with an opening the same size as the upper and covered with cloth in the same

manner, only that the cloth does not project over the ends. A good quality of glue should be used to fasten the top and bottom cardboard securely to the glass and also for holding the cloth over the ends and to the bottom board.

Nearly all text-books pertaining to pathological technic give the formula for Kaiserling's fluids, but for the benefit of those who do not possess such a work I will give the formula, which is as follows:

No. 1—Kaiserling's Fixing Fluid:

Nitrate of Potash.....	15 gms.
Acetate of Potash.....	30 gms.
Formalin	200 c.c.
Water	1,000 c.c.,

(Alcohol, as stated before, to restore the color.)

No. 2—Kaiserling's Preserving Fluid:

Acetate of Potash.....	100 gms.
Glycerin	200 gms.
Water	1,000 c.c.

The preserving fluid should be boiled for five or six minutes before using and allowed to cool to about 80 degrees F. This answers the double purpose of destroying mold spores and of driving off the most of the absorbed and imprisoned air in the fluid, thereby lessening the danger of bubble formation and subsequent growths of molds.

REFERENCE.

- (1) Watters, New York Medical Journal, August 23, 1902; Vol. 76, p. 318.
- (2) Coplin, Journal of the American Medical Association; August 13, 1904; Vol. 43, p. 441.
- (3) Albert, Journal of the American Medical Association; June 30, 1906; Vol. 46, p. 1993.
- (4) Watters, Medical Record; December 22, 1906; Vol. 70, p. 988.

FROM OHIO TO GEORGIA.—Dr. Chas. A. Klein, formerly of Cincinnati, Ohio, has been transferred by the B. A. I. service to Augusta, Georgia. The REVIEW wishes the doctor happiness in his new home.

DR. RIETZ JOINS THE HAWKEYES.—Dr. J. H. Rietz, Pittsburg, Pa., has gone to Ames, Iowa.

A RESUME ON THE CONTROL AND ERADICATION OF GLANDERS.*

BY DR. H. D. GILL, DIRECTING THE WORK FOR THE COMMISSIONER OF AGRICULTURE IN THE CITY OF NEW YORK.

SYLLABUS.

1. *Official concentrated control:* Experience has shown that the best work can only be done under official jurisdiction. Ofttimes local veterinarians have been swayed in the rigid enforcement of laws, regulations and rules, through the interference of their general practice, disposition, temerity, insufficient pay for service, personal suasion and undue influence. The effect of such control on the horse-owning public would be advantageous.

2. *State or city quarantine:* The importance of this is obvious.

3. *Tagging, branding or marking for positive or permanent identification:* The many cases of similarity in the general description of horses makes a more positive mark of identification indispensable.

Experience and careful consideration suggests the use of a small band ear tag in preference to other. Tagging has many advantages in sanitary police work, and also protects the general horse-buying public. Horse owners, enlightened by diagnostic tests, spread glanders through their indiscriminate disposition of reacting animals, while if these were marked, such cases could be checked and traced back to the source of infection.

4. *Control of all diagnostic tests for glanders and the use*

* Presented at the request of the Special Committee for the Detection of Glanders of the American Veterinary Medical Association, at its fiftieth anniversary meeting in New York, September 1-5, 1913.

or application of any agent or substance that would counteract or interfere with correct results of sera or mallein tests: The indiscriminate use of such tests are in the main the cause of the present prevalence of glanders in this city.

The method for all tests and the agents used should be standardized. Mallein should be refined, thus eliminating agents that might, through their irritating effects, cause thermic disturbances, giving false and misleading results. Mallein should be put up and kept in the best way to maintain its potency and keep the same from deterioration or contamination.

The ideal way would be for laboratory control and delivery for immediate use.

5. *Licensing all places where horses and mules are stabled, kept, shod, fed or watered:* This would be of incalculable value to the police sanitary work. The disinfection could be properly carried out; bad sanitation and hygiene could be corrected; stables quarantined and closed until adequate repairs or improvements could be made.

6. *Control and disposal of glandered horses:* All clinical or physical cases should be killed on sight. Such horses being of no value, except for offal, no indemnity should be paid by the state. All animals giving a positive reaction to at least two of the several accepted tests, should be considered glandered and destroyed as such. To facilitate good work it would be well to pay a liberal indemnity for the latter cases. No clinical cases should be kept for treatment or experimental purposes except under state control and in such place and under such conditions as the Commissioner of Agriculture shall designate.

7. *Post mortems should be made on all horses dying within the city limits:* This would check horses surreptitiously disposed of and through pathological investigation corroborate tests and other diagnoses. This would also be valuable for complete and correct statistics.

8. *Practical method for promptly eradicating glanders from among horses in stables and ultimately in the city and state:* Kill and post clinical cases. Make two blood tests, one comple-

ment fixation, one agglutination, of all the other horses in the stable, checking the same with a mallein eye test. Horses giving positive response to all three tests should be considered glandered and destroyed.

The use of subcutaneous injection of mallein should be discouraged. Such injections counteract and interfere with correct results of subsequent sera tests, which are found to be uncertain and misleading where mallein or vaccine has previously been injected.

Uncertain mallein tests have often been the cause of embarrassing delays, controversies and expense. With the tagging of all horses tested, work along these lines will be more satisfactory, the records and statistics more accurate, and valuable data would then be available.

THE FIFTIETH ANNIVERSARY OF THE FIRST INTERNATIONAL VETERINARY CONGRESS is to meet in London during the coming summer. A special effort is being made to furnish a program replete with the best in possession of the veterinary profession and make it a fitting semi-centennial of fifty years of progress. American veterinarians should make every possible effort to attend this meeting. It is very probable that the American Veterinary Medical Association will not hold its regular annual meeting in September, as has been the custom the past few years, but it will probably meet in New Orleans during the week of the holidays. This will give the members an especial opportunity for attending both meetings.

All who attend the international congress from this country will have a special opportunity for visiting Continental Europe at a minimum additional expense by joining the touring party under the able direction of Dr. Eichhorn. Many opportunities will be afforded a party of this kind that could not be gotten individually. It should be the rare treat of a lifetime. Those who anticipate making the trip should notify Dr. Eichhorn as soon as possible so that complete details can be worked out at an early date.

You are especially urged to join the party and participate in the rare treat that is in store for those who are going with this party, which will end its study and pleasure tour by attending the International Veterinary Congress.

(Signed) C. J. MARSHALL,
President, American Veterinary Medical Association.

REPORTS OF CASES.

CEREBRO-SPINAL MENINGITIS OF THE HORSE.*

By B. F. KAUFF, in Charge Field Laboratory Investigation, Holly, Colo.

HISTORICAL.

Hutyra and Marek in their English edition of Pathology and Therapeutics of Diseases of Domestic Animals say:

"Epizootic cerebro-spinal meningitis of the domestic animals is an independent infectious disease characterized by inflammation of the membranes of the brain and spinal cord and the adjacent nerve tissue. In certain districts the disease is enzootic and even tends to be epizootic."

"In 1896 Siedamgrotzky, Schlegel and Johne simultaneously carried out extensive bacteriological and pathological investigations as to the nature of the disease. Further researches were made by Ostertag in Germany in 1900 and in America by Wilson and Brimhall in 1898 to 1903, making a clinical bacteriological as well as pathological study. Investigations were also made by Streit in 1902, Harrison in 1905 and Christian in the same year." "Histological investigations which were made by Dexler in 1900 and more recently by Oppenheim in 1907, have furnished proof that cerebro-spinal meningitis or Borna disease is an inflammatory one."

"Siedamgrotzky and Schlegel found a micrococcus and more rarely a diplococcus in the subarachnoid fluid. This organism formed a dirty white, sharply circumscribed colony on the surface of gelatin. Intravenous inoculations with cultures into horses in one case produced no effect, in a second there were symptoms and slight brain disturbance and the micrococcus was demonstrated in the cerebro-spinal fluid, a third injection was followed by symptoms of sleepy staggers. Subdural inoculations into

* Presented to the fifteenth anniversary meeting of the American Veterinary Medical Association, at New York, September, 1913.

[Note]—As this article includes a clinical study and postmortem findings on a large number of cases, we have placed it under "Reports of Cases"; although it is also in every sense an original article.—Ed.

horses caused severe meningo-encephalitis, the cocci being demonstrated in pure culture in the exudate."

"Johne found diplococci in the cerebro-spinal fluid and in one case in the blood of diseased horses. Some were free, some were included within the cells.

"The cultural characteristics resembled those of Siedamgrotzky and Schlegel organism and short chains were formed. This organism was called by Johne *diplococcus intracellularis equi*. Typical symptoms of Borna disease followed the subdural inoculations of the organism into two goats and three horses. All the horses recovered while the goats died."

"Similar diplococci were found by Marcq in diseased horses in Belgium."

Organisms morphologically resembling the diplococci of Johne were found by Ostertag in cases of Borna disease. They were present as a rule in the subdural and ventricular fluid of the brain and occasionally in the blood, liver and urine.

"The organism designated by Ostertag as Borna streptococcus was pathogenic for the horse and cattle. Pigs did not contract the disease."

"Streit isolated an organism closely resembling and possibly identical with the streptococcus of Borna disease from a case of epizootic cerebro-spinal meningitis in a horse in Ontario, as did also Grimm in southern Germany."

"Christian found an exactly similar organism in primary sporadic meningitis in the horse."

HISTORY OF THE RECENT OUTBREAK OF CEREBRO-SPINAL MENINGITIS IN THE MIDDLE WEST.

On July 20, 1912, an apparent infectious disease was observed among horses some 10 miles north of Dodge City, Kansas. This disease spread for a radius of several miles, extending over the major portion of Kansas and Nebraska, where the greatest loss occurred, and later invading particularly northern Oklahoma and eastern Colorado. For the most part no restriction was placed on intra- or inter-state shipment of horses from or in the infected district. So far as the writer knows no definite data as to actual loss was kept but it has been variously estimated that from 20,000 to 30,000 horses were lost from this outbreak. There were very few mules that contracted the disease.

The disease spread to the eastern tier of counties of Colorado about the first of September. Dr. George H. Glover, chairman of the Division of Veterinary Medicine and of the Veterinary

Section of the Experiment Station, made a trip to the infected district and a brief field investigation was made. The station authorities then decided to establish a field laboratory at Holly, Colorado. This laboratory was supported by funds appropriated by the five counties, namely: Prowers, Crowley, Bent, Otero and Pueblo.

Appearance of the Disease in Colorado: An immigrant came to Hartman, one center of the disease in Colorado, just nine days before the first case appeared in that locality. The man had a horse sick of the disease at that time, and after staying a time around the alfalfa mills went four miles west and camped. Later, the sick horse died.

At the second center where the disease appeared, an immigrant came and camped on the premises just eight days before the first case appeared on that place. The immigrant had a horse sick of the disease. The horse later died. Prior to these two incidents an immigrant came to Granada with a horse sick of the disease. The horse died. No animals came down with the disease at this locality till about four weeks later.

Climatic Conditions: The stricken district in Colorado lays approximately 4,000 feet high and in the dry country. The pastures in the bottoms consist of slough grass, salt grass, with blue stem, buffalo grass and gamma grass. These grasses grow sparingly over the pastures and do not form a matted bunchy condition. The pastures soon become dry after showers.

A study of the weather records at the weather bureau at Ft. Collins shows that more rain fell in Northern Colorado, where the disease did not exist, than in the eastern and southeastern parts stricken with the disease. A study of the records of the stricken district for ten years back shows a greater rain fall in two other years.

On the night of August the 13th there was a heavy precipitation, which caused the Arkansas river to overflow. There was only one shower after that time and that fell the last week in August. There was no rain fall in that district from that time till November.

In the district stricken by the plague there was only one light frost, and no frost heavy enough to kill the sugar beet tops till after the third week in October.

The greatest loss of horses in Prowers county was between September 15th and October 1st.

Feed and Water: Some horses were fed cured cane, some second-cutting alfalfa. The majority were at times on pasture.

The ranchmen of Colorado do not feed their first-cutting alfalfa at this season of the year and it was with some difficulty that we secured some for our experimental animals.

The water supply on the premises where the disease appeared in some instances was from wells varying in depth up to 800 feet. In others from irrigation ditches.

Some of the animals were kept up the entire summer for routine ranch work and fed wholly on dry feed.

Mortality: Our records show that there was 1838 horses in the stricken district investigated. Of these 154 contracted the disease and 30 died.

The horses that grazed on the river bottoms overflowed by the August flood did not come down with the disease. A very few were on salt grass pasture. The most were on high gravelly ground north and a few south of the river. The principal loss was around the towns of Hartman, Amity and Bristol. These pastures were high, dry and gravelly.

Horses of all ages, breed and sex were affected. Dr. Glover observed a case in a suckling colt and others in livery horses on dry feed and constant livery service. Work horses in the field and in the pasture were affected alike.

Clinical Study and Post Mortem Findings: In our investigation work we made it a rule to study only typical clinical cases. At death a careful autopsy was held, specimens secured for laboratory study; this included affected tissues, urine, brain and spinal fluids. The brain and spinal fluids were drawn under strict sterile laboratory methods.

A few selected typical case records will be given to better show conditions found.

CASE NO. 2—History: Black mare, 8 years old. Went down two hours after taking ill and died in about 12 hours. Has been on native pasture. The source of water was from an irrigation ditch.

Symptoms: At the time seen the temperature was 104.8 degrees Fahr. Pulse 58 and full. The respiration is slightly accelerated. The reflexes are absent. When pricked with a pin from head to foot and from head to tail she does not flinch. There are a few erosions on the mucous membranes of the lips. The tongue is coated with a whitish, fuzzy, slimy material. The first heart sound is prolonged. Nearly falls when pushed, showing great prostration. The animal is stupid. The head is turned to the right side. She refuses to move when urged to do so. Later the animal goes down showing spasms of the entire musculature.

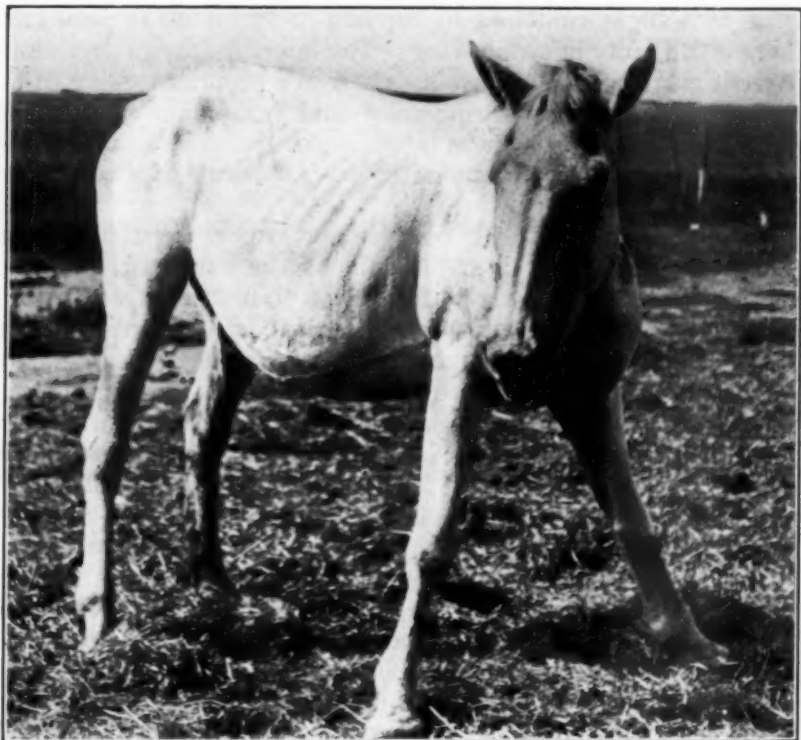
There is a slight rumbling of the bowels. The tail is paralyzed. There is difficulty in swallowing. The lower lip hangs pendulous. There is partial facial paralysis. There is a peculiar tossing of the head. The ears are perpendicular and occasionally spasmodic movements are noted. There is ptosis present. The animal braces itself, finally goes down and after several hours in a comatosed state dies.

Autopsy: The brain is congested. This congestion extends into the cord. There is hyperemia of the epiglottis, pharynx, vocal cords and trachea. Both kidneys show active and passive congestion and cloudy swelling. Perineal edema is present. The liver is enlarged and shows congestion and cloudy swelling. The heart shows slight congestion of the vessels of the musculature. There is a verminous aneurism of the great mesenteric artery due to larval strongiles. There is a catarrhal inflammation of the stomach and entire intestinal tract. There is a catarrhal inflammation of the bladder with a precipitation of considerable calcium carbonate. The marrow of the long bones is very dark, areas showing hemorrhage, still other parts showing congestion.

CASE No 3—History: Gray gelding, 13 years old. Has been sick 32 hours. This animal's feed consists of cured cane. The water was from a shallow well.

Symptoms: The head is turned to one side. The temperature is 105 degrees Fahr. The respiration and pulse is accelerated. The animal is weak with wabby gait and nearly falls down when pushed. The reflexes are partially absent. There is grinding of the teeth. There is a bracing attitude, the legs being placed wide apart. Perspiration appears in spots over the body. The step is rather high as if not able to judge the step. The animal is up and down. There is a tossing of the head and the ears are held erect. There is a quivering of the muscles and difficult swallowing. The pupils are normal. The animal rests its head in the corner. An analysis of the urine shows the following: Specific gravity 1.022. There is no sugar. There is no albumin. The animal is finally unable to stand, goes down, comatosed, and after several hours dies.

Autopsy: The tongue is coated with a fuzzy, slimy whitish material. There is hyperemia of the pharynx, larynx and trachea. There is a catarrhal inflammation of the gastro-intestinal tract with small hemorrhages (suggillations) (stomach, small and large intestines, floating colon and rectum). There is a catarrhal inflammation of the bladder with small hemorrhages. There is retention of the urine. The liver is greatly enlarged (nutmeg



Case No. 14. A Typical Field Case. Note the attitude of the ears, ptosis, dropped lower lip, bracing attitude of the legs and head turned to one side.

liver) congested and cloudy swelling. The kidneys show active and passive congestion and cloudy swelling. The heart shows congestion with small hemorrhages under both the epicardium and endocardium. There is a normal amount of pericardial fluid. There is congestion of the brain with appearance of inflammation. There is also some pin point hemorrhages in the ventricles of the brain. The spleen is about normal size with nodular thickenings. There are hemorrhages throughout the cancellated portions of the long bones.

CASE NO. 14—History: Gray mare, twelve years old. This animal has been sick eight hours. This animal has never been on pasture but kept up for routine ranch work and on mature feed. The water was from an 800 foot well at all times.

Symptoms: The head is turned to the right side. There is grinding of the teeth. There is a nervous twitching of the head. This animal has some difficulty in swallowing. There is great

weakness and prostration. The animal stands in a bracing attitude. See photograph No. 1. The eyes are partially closed, the ears are weaving to and fro. The lower lip hangs pendulous and the nostrils are dilated. There is some weaving of the body and the reflexes are partially absent. The hind legs are at times crossed and the fore legs spread far apart. The breathing is shallow. At this time the temperature is 104.2 degrees Fahr. The pulse is 52, full and weak. The respiration is somewhat accelerated. There is some slobbering. There is a peculiar smacking noise made by the mouth. The tail is paralyzed. The head at times is carried rather high. The crural group of muscles on the left side are in a state of tremor. The animal stands but cannot walk, and when urged to do so falls to the knees, but with time regains her foothold and arises. There is a droopy condition of the ears. There is ulceration of the mucous membranes of the lips. The pupils are not dilated.

The eyeballs roll back and forwards in their sockets. Later the breathing is labored, dilated nostrils, reflexes absent, no vision, she goes down. The legs are extended and stiff. The pulse is still large and full. After remaining unconscious for several hours she is destroyed for autopsy purposes.

An analysis of the urine shows the following: Specific gravity 1.030. Sugar is present in considerable quantity. There is no albumin.

Autopsy: The tongue is coated with a fuzzy, whitish sticky material. The pharynx, larynx and trachea are normal. The gastro-intestinal tract is normal except a portion of the colon about one foot long, which shows some congestion and slimy-like mucous. There is a catarrhal inflammation of the bladder with small pin point hemorrhages. There is a considerable quantity of calcium salts in the bladder. The liver is enlarged and shows congestion and cloudy swelling. The kidneys show active and passive congestion and cloudy swelling. The brain shows active and passive congestion and more or less evidence of inflammation.

MICROSCOPIC FINDINGS.

The microscopic study of sections from various tissues of field cases after hardening in 10 per cent. formaldehyde and embedding in celloidin and staining with hematoxylin and eosin showed the following:

Liver: There is active and passive congestion present. There is cloudy swelling and some areas of focal necrosis. There are some areas of round celled infiltration with a few polymorphonuclear cells.

Kidneys: There is active and passive congestion with a few focal areas of cellular infiltration mostly round celled. Cloudy swelling is present.

Pharynx and Larynx, as well as the stomach and intestines, when affected show congestion and some areas of cellular infiltration.

Heart: There is a congestion of the myocardial vessels.

Brain: The pia-arachnoid membranes are in a state of congestion and infiltrated with round cells and polymorphonuclear leucocytes—acute inflammation. Cellular infiltration like that of the coverings of the brain is especially well marked in the cerebrum perivascularially and focal areas throughout the brain substance. Small areas of hemorrhage are noted through the brain substance. The vessels are congested.

Spinal Cord: The section through the central canal shows many leucocytes, many are polymorphonuclear. There is quite an infiltration around the canal in the cord substance. In the cord substance and particularly in the ganglionic part there is a cellular infiltration as well as a few focal areas of round cell and polymorphonuclear infiltration. The coverings of the cord are congested and are at points infiltrated to a more or less extent as the brain.

Urine Study: The urine was studied in 4 cases. In none was albumin found. There was sugar found in two of the cases. The specific gravity ranged between 1,022 and 1,050. Calcium salts was also abundant and in suspension. The urine was always slightly alkaline.

Blood Study: A differential blood study was made on six cases with the following results:

Case No. 1: Neutrophiles, 94 per cent.; lymphocytes, 6 per cent. *Case No. 3:* Neutrophiles, 76 per cent.; lymphocytes, 21 per cent.; mononuclears, 2 per cent.; eosinophiles, 1 per cent. *Case No. 4:* Neutrophiles, 91 per cent.; lymphocytes, 8 per cent.; mononuclears, 1 per cent. *Case No. 6:* Neutrophiles, 88 per cent.; lymphocytes, 10 per cent.; mononuclears, 2 per cent. *Case No. 7:* Neutrophiles, 89 per cent.; lymphocytes, 11 per cent. *Case No. 14:* Neutrophiles, 98 per cent.; lymphocytes, 2 per cent.

BACTERIOLOGICAL STUDY.

Only a preliminary report can be made at this time on our bacteriological study as the disease subsided before this part of the work was completed.

The spinal fluid was obtained at autopsy by carefully cutting away the musculature over the occipito-atloid space, searing the surface with a hot spatula and drawing the fluid with a sterile syringe and placing the fluid in a sterile bottle.

In the fluid examined from 18 cases at autopsy there was found a coccus, at times in chains and showing a diplococcic arrangement. The organism lost practically all the gram stain so that it was practically gram negative although it may by some be considered as laying mid-way between gram positive and gram negative. The constancy of the presence of these organisms drawn under these conditions prompted us to try inoculations. These organisms were found in spinal fluid from cases which had been killed for autopsy purposes hours before they would have died from the disease.

This organism forms a dirty gray growth on agar plate. It has smooth borders and is slightly raised. It does not liquefy gelatin. It forms a filiform growth on agar slant, showing no tendency to spread.

This organism when injected subdurally in two horses produced symptoms simulating the field cases and at autopsy showing some of the lesions found in the field cases. When inoculated into the jugular vein it produced toxic symptoms from which the animal showed a tendency to recover, but repeated doses proved fatal.

This organism is always fatal when inoculated subcutaneously, subdurally or intraperitoneally into rabbits and guinea pigs, the guinea pigs showing more resistance than the rabbits.

Chickens showed no ill effects when inoculated by the mouth or intraperitoneally.

Dogs showed no ill effect when given subcutaneously, but some toxic effects when given intraperitoneally, and fatal when inoculated sub-durally.

In addition to this organism above described there were five other diplococci studied and proven separate and distinct micro-organisms and by animal inoculations to be non-pathogenic. At this time these organisms may be regarded as saprophytic and associated with the horse. For convenience these organisms will be regarded as numbers 1, 2, 3, 4 and 5.

Diplococcus No. 1: Upon agar the colonies resemble that of the micrococcus catarrhalis of the human. The colonies appear with a light border with a denser center, taking on a yellowish tan tinge with age. The border is irregular. The center is raised. The colony is friable, not viscid. The colony may at-

tain the diameter of 2.5 to 3 m.m. It grows rapidly at room temperature. It is gram positive. It stains well with ordinary aniline dyes. It is biscuit shaped, most often in pairs. The approximating edges are flat.

Upon agar stroke there appears a luxuriant growth, wrinkled with no tendency to spread, at first white, later it takes on a yellowish then a yellowish tan color.

In bouillon it produces only a slight cloudiness and a whitish precipitation.

In gelatin growth takes place along the entire needle tract. The surface growth is limited, showing no tendency to spread, and first white, later a yellowish-tan tinge. No liquefaction takes place.

The organism is both aerobic and anaerobic.

Diplococcus No. 2: This diplococcus appears as a grayish colony with intact border and a denser center. Upon agar plate these colonies do not attain the size of diplococcus No. 1. The maximum diameter is from 1 to 1.5 m.m. It stains with ordinary aniline dyes and is gram positive. It grows readily at room temperature. Older cultures become wrinkled, grayish and brittle. The contact borders of the cocci are flat.

On agar slant the growth shows no tendency to spread, is echinulate. Older cultures become wrinkled, elevated and gray.

Diplococcus No. 3: On agar plate the colonies attain the size of .5 to 1 m.m. in diameter and are a light tan color. On agar stroke it has a tendency to grow beaded. The micro-organism stains with the ordinary aniline dyes and is gram positive. The contact borders are rather flat.

Diplococcus No. 4: On agar plate the colonies are whitish-gray and may attain the diameter of 1 m.m.

On agar stroke the growth has a tendency to appear beaded. It does not liquefy gelatin and grows along the entire needle tract.

In bouillon it may form chains. The bouillon is clouded. It grows readily at room temperature. It is gram negative. It stains readily with the ordinary aniline dyes.

Diplococcus No. 5: In gelatin stab it grows along the entire needle tract. It does not liquefy gelatin.

In agar stab growth takes place along the entire needle tract.

On agar plate the colonies appear as whitish to whitish-gray and attain a diameter of .5 m.m. These colonies closely resemble those of streptococci.

On agar stroke a beaded growth appears.

In bouillon it may appear in chains. The bouillon becomes clouded. It is gram negative. It grows readily at room temperature.

DIFFERENTIAL DIAGNOSIS.

Poisoning from eating sprouting potatoes when it is said large quantities of solanine is contained in the peeling of the potatoes produces symptoms which have been mistaken or have been referred to as identical with the horse plague.

Poisoning with moldy worm-eaten corn has been referred to as identical with the horse plague. In all our autopsies we did not find liquefaction necrosis as is always present in the moldy corn poisoning cases, although some of our cases lived several days before dying.

Sugar beets when becoming rotten, as well as other root crops, produce a condition which has been likened to the horse plague.

There are many practitioners who are careful observers and who worked in the stricken district who share the views of some of the laboratory men that the horse plague is a separate and distinct disease.

Sage Poisoning: During our investigation work at Holly, a call came from Fowler, Colorado, to come and investigate a disease feared to be "horse plague."

History of the Outbreak: The pasture is hilly and covered with native grass. It contains considerable sage which has seeded.

Horses pastured on this ground four years previous contracted the same disease. That was at the same time of year after the sage had fruited. It was noted that the horses acquired a liking for the sage. About thirty horses were pastured on this field and six had become affected.

Four of the cases were only slightly affected and soon recovered, while two were extremely ill and are here described.

Case No. 5: Bay mare two years old. Had been down 48 hours, but is now up and eats and drinks. There is no difficulty in swallowing. The animal appears nervous. There is a stiff gait and considerable weakness. The entire vertebral column shows a peculiar stiffness. The vision is partially affected. The head is not turned to one side. There is no grinding of the teeth. There is no droopy eyelids. Many other symptoms of "horse plague" are absent. This case finally recovered.

Case No. 6: Brown gelding, 2 years old. This animal has been down 24 hours. The temperature is 101.2 degrees Fahr.

There is a stiff gait, the animal is nervous. The head is carried rather high. The vertebral column is carried rather stiff.

It has been noted that in pastures containing *Artemesia filifolia* (one species of sage), that horses acquire a taste for it; particularly after frost has killed the buffalo and other grasses.

Some experiments were conducted by the writer, but only a preliminary report can be here given.

A tincture was made from the dried sage gathered from this field. The following experiments were run.

Experiment No. 1: A young fox terrier dog weighing 18 pounds was given 7 drams of this tincture by the mouth. This was given at 9.40 A. M. on an empty stomach. At 9.50 A. M. the animal rolls. At 10.00 he appears weak, partially paralyzed in hind quarters, staggers and repeatedly falls. At 10.07 there is normal defecation. At 10.11 he vomits. At 10.17 there is marked depression. He lays down continually, and at 10.24 he again vomits. At 11 the extreme symptoms are subsiding.

A check was run on this test. The dog used was one weighing the same. This dog was given the same quantity of alcohol that was contained in the tincture that was given to the dog in experiment No. 1. The animal rolled, appeared slightly intoxicated, but did not vomit or show weakness of the hind quarters.

Experiments Nos. 2 and 3 were conducted in a like manner and gave similar results.

Experiment No. 4: A white rabbit weighing about 4.5 pounds was given 4 c.c. of the tincture intraperitoneally at 4.35. At 4.38 the rabbit showed weakness of the hind quarters, accelerated respiration, involuntary urination, stilty spinal column. At 5.18 the animal cannot walk, lies prostrate. At 5.22 he can sit up and when urged can walk some. At 8.30 A. M. on the following day the animal sits and walks but appears ill. The surface of the body is cold, indicating poor circulation. The head is thrown back, the temperature 94 degrees Fahr. The animal died the morning of the 24th.

Autopsy: The meninges are congested. The venous sinuses and veins of the cord and medullary region are congested. The liver is of normal size but shows passive congestion. The heart has apparently stopped in diastole.

A rabbit of the same weight was given the same quantity of alcohol contained in the tincture given to the experimental animal and in the same manner. This rabbit showed intoxication, but not the peculiar stiff spine of the same degrees of affection of the hind quarters.

It is recognized that strong infusions of *Artemesia filifolia* produce nausea and vomiting in the human. After its administration sleep ensues with free perspiration. The action of the heart is increased.

The plant grows about one foot high, presents a silky appearance, the stems are single or branches, and bear numerous racemose disposed heads in an open panicle. The leaves are divided into linear crowned lobes. It is found in the Rocky Mountain region. So far as the writer knows, those working in the field have not been able to reproduce "horse plague" by feeding moldy hay eaten by horses contracting the disease, although such experiments were conducted. Neither has the disease been produced by growing any of the various molds (found on such hay) in the laboratory and feeding it to animals.

We believe that at the present time no one can definitely conclude just what the cause is, and any such statement must be regarded as poor judgment. Future study, should this identical disease reappear, must be made along the lines followed in the last outbreak.

TWO INTERESTING COW CASES.

By E. A. WESTON, B.V.Sc., University of Western Australia, Perth, W. A.

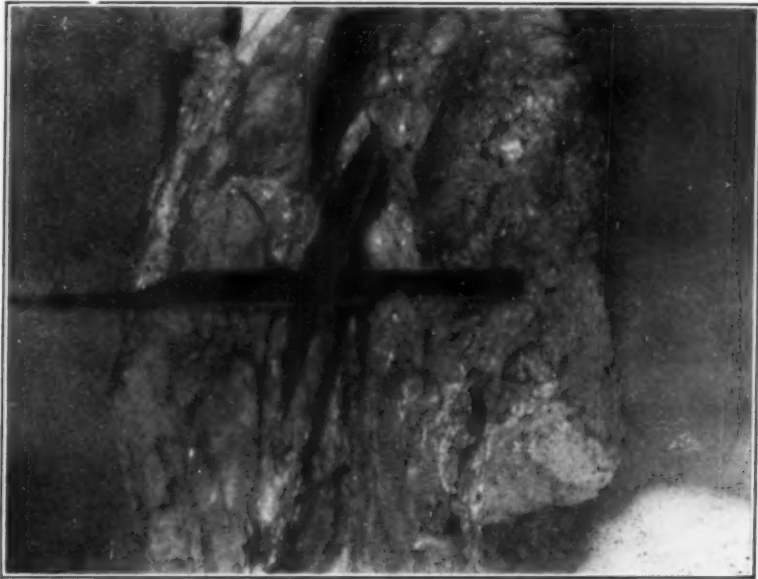


First Case. Red, crossbred cow milking in one of the dairies supplying this city. She was unthrifty and reported to be affected with chronic diarrhœa. I decided to tuberculin-test her. She was inoculated 8.30 p. m., when she showed a temperature of 103° F. The subsequent temperatures were as follows, the first one being taken at the twelfth hour after inoculation:

12th	15th	18th	21st
101	101	103.4	105.6

On post mortem she proved to be extensively affected with tuberculosis, and photo No. 1 shows a portion of her costal pleura. This case serves to further emphasize the unsoundness of the dictum that no further temperatures need be taken if no rise occurs by the 16th hour. On two other occasions I noted temperatures showing a slight rise on the 18th hour, and giving a typical reaction on the 21st; but I had not an opportunity of confirming the test by post mortem.

Second Case. Photo No. 2 shows a long piece of bone encysted in the anterior lobe of the right lung of a cow, which I



destroyed for tuberculosis on account of cough, wasting and other suspicious clinical symptoms. She proved to be affected, though not as extensively as I had anticipated. There was, however, an extensive dry pleurisy, with numerous adhesions, and when pal-

pating the lungs I encountered a hard substance. On cutting down on it, I discovered the bone shown in the photo. The black object seen underneath it is the handle of a scalpel inserted to show the bone up better. Where this bone came from I can only surmise. It did not lie in a bronchus and could hardly have come via the trachea. On the other hand, there was no track to mark its passage from the reticulum. I am inclined to think, however, that it came via the stomach, and was for a time free in the thoracic cavity, thus setting up the extensive pleurisy seen on post mortem.

MEDICINE DIRECT.

By W. B. Cook, D.V.M., Albany, Oregon.

The case, one of flatulent colic in a valuable heavy-draft mare. I was with this animal the most part of time, from 3 p. m. on Friday until 7 p. m. on Saturday, during which time I had given medicine regularly, such as the aromatic spirits of ammonia, the extract of capsicum, turpentine, nux vomica, aconite and arecoline hypodermically. Having passed the stomach tube four different times, giving medicine in buckets of water at such times. I also gave four rectal injections and tapped the animal twice on Friday, the first time at 3 p. m. and again at about 11 p. m.

I won't attempt to describe symptoms in detail. All are familiar with such cases and know that the symptoms change greatly from hour to hour.

By 5 p. m., Saturday, my case seemed hopeless. The animal was bloated up like a balloon again. I decided to tap her a third time, which allowed a great quantity of gas to escape.

Then I proceeded to get medicine to the right spot. With the canula in position, I injected through it into the intestines three drams of the carbonate of ammonia dissolved in about two ounces of water and half an ounce of aromatic spirits of ammonia diluted in water.

I left the animal quite at ease at 7 p. m. At 8 a. m., Sunday, I learned by 'phone that the mare had drank quite a lot of water towards morning, was up, and had an appetite for breakfast.

She had no more symptoms of bloating and recovered beautifully.

This is the second time I have used the trocar and canula in this way and with excellent results.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

SCROTAL HERNIA IN A FOAL [*James Gregg*].—A valuable, pure-bred Shire foal, 24 hours old, has scrotal hernia. He has difficulty in passing feces, strains considerably. There is a swelling as big as a coconut in the off groin. The little fellow has abdominal pains, stopped sucking and is very weak. Put on his back, and held with three men, the parts are well washed and disinfected, and by careful manipulations the hernia is reduced. The skin was then incised and the testicle removed by covered operation, about $\frac{1}{2}$ inch below a ligature applied on the hernial sac, as high as possible. Few sutures closed the skin wound. Careful antiseptic measures were ordered. The foal got up after the operation, had a suck, a motion of the bowels and gave no further trouble. The external stitches were removed after three days. The after-treatment consisted in the administration of 2 ounces of castor oil and boric acid lotions applied twice a day.—(*Veter. Record.*)

LYMPHADENITIS AND MULTIPLE CUTANEOUS TUMORS IN A HORSE [*A. Kragerud*].—The case, on superficial examination, looked like glanders. The animal was covered with numerous round nodules, arranged partly in ranks and varying in size from that of a hazelnut to a walnut. There was greyish serous discharge from both nostrils, and in the nose little, round, raw surfaces. The appetite was good and the general condition unaffected. On post mortem the raw surfaces were found on the nasal mucosa. All the lymphatics of the body were swollen. According to the writer, the disease began three years previous; the horse had been treated for strangles. It was only recently that some of the nodules had ulcerated.—(*Veter Journ. and Deuts. Tier. Woch.*)

SARCOMA OF THE STOMACH IN A HORSE [*Chief Veterinary Surgeon Mallauer*].—A seventeen-year-old horse has always been a good eater and worked well. For a year past he has lost flesh and became reduced in condition. He is almost a skeleton. He was destroyed. The post mortem revealed degeneration of the stomach, which was as big again as normal and showed externally raised spots, as large as a child's head, which were hard, and some others fluctuating. Inside the organ there was thick pus, which had escaped through fistulous tracts, opening and running through the mucosa and in various parts of the tumors seen outside, on the external surface. The examination of the stomach, when completed, brought out the conclusion that the case was one of sarcomatous degeneration of the organ.—(*Veter. Journ. and Zeitsch. f. Veter.*)

PARTURITION CASE [*Gray Sutton, F.R.C.V.S.*].—One bitch, toy variety, was mated with success. At term she has great difficulty and pains to deliver. The vagina is so constricted that a finger can scarcely be introduced. The uterus is well up. The membranes have ruptured. With difficulty the head of a puppy can be seized and crushed with a forceps introduced with great care; the puppy is brought near the vaginal outlet, but no further. An operation is decided and the abdomen opened. It contains foetal fluid and shows a tear of the uterus. This organ and the contents are removed, the abdomen flushed and cleaned with boiled water. The uterine stump was swabbed with iodine solution diluted. The uterus contained a large puppy. Recovery was uneventful.—(*Veter. Journ.*).

CEREBRAL PARALYSIS [*James Charlmers, M.R.C.V.S.*].—Rough-haired Irish terrier dog is found lying huddled up and apparently unconscious with blood over the head and running out of the nose. He was affected with cranial hemorrhage, epistaxis and secondary paralysis. The temperature was 100°·6 F. The trouble was due to a shot wound, a small bullet having entered on the right side of the median line, on top and back of the head, having glanced through the skull to come out on the left of the median line in front of the symphysis of the inferior maxillary bone. The right eye was distended with hemorrhage and the ocular lumen suffused with blood. *Treatment*—No probing of the wound, which was treated externally only with lotions of chinosol. Inhalations of terebene and tincture of benzoin were used to keep the nasal cavities cleared. Internally pills of bromide

of potassium and ammonium were administered. Iodide also with strychnia. Diet, milk, eggs and nutritive gruel.

After two days slight improvement made its appearance, and with tonics, stimulants and stronger food the animal began to attempt to walk, with the peculiar symptom that he lifted the front paws high off the ground. He had also a tendency to collapse on the right side. Recovery gradually took place, leaving the patient with the peculiar action of its fore legs and a small exostos is on the parietal bone where the bullet had penetrated.—(*Veter. Journ.*).

UNUSUAL SEQUELA TO CASTRATION [*Arnold Spicer, F.R.C.V.S.*].—Three colts were castrated. Two were two years old, the third a yearling. The oldest teased the young one so much that he had to be taken in at night, passing through a very dirty yard where he was kept. After the fourth day, while the two-year-old colts were doing well, the yearling began to swell down the near hind leg and along the belly and sternum. In about a week the skin sloughed from the scrotum to and along the near side, about nine inches wide. There was also a bad slough on the near side of the scrotum and one on the inside of the thigh. The colt never went off his appetite. It was a bacterial infection contracted while going through the yard or in the box, which was covered with peat moss.—(*Veter. Record*).

AN EXTRAORDINARY INJURY [*J. C. Powell, M.R.C.V.S.*].—Two-year-old pony had been turned out. He is found in the morning struggling in the field, cast with the off hind foot tightly entangled in his mane, and so securely was the foot tied up that a considerable portion of the mane had to be cut off to free the leg. When the colt was relieved, it was found that there were such severe injuries of the ligaments of the stifle and of ruptured muscles that the animal was destroyed. It was certainly an extraordinary case.—(*Veter. Journ.*)

PYELO-NEPHRITIS IN A FOAL [*W. R. Davis*].—Valuable thoroughbred foal, a few weeks old, was removed from the stud farm in a cart, and the next day was unable to get up, had profuse diarrhoea and was lame on the off hind leg. The navel was still open and suppurating. The writer made it a case of navel-ill, and treated her with bismuth hæmatoxylin and resorcin, nuclein hypodermically and chinosol solution on the navel. The off hind leg was sore, and on the near fore there was a swelling

of the elbow, which was also quite painful. In the course of a month the foal improved and was turned out to grass. Some days after, swellings appeared on the head, breast and abdomen. Food was refused, violent colics were exhibited, and death took place. At post mortem were found the urachus thickened, inflamed and hemorrhagic, the bladder empty, with the walls thick and the mucous membrane swollen, pulpy and very red. The kidneys were greatly enlarged and in their distended pelvis there was muco-pus, the kidney tissue being flabby and friable, making it difficult to distinguish between the cortex and the medulla.—(*Veter. Record*).

UNUSUAL SUSCEPTIBILITY TO COCAINE [*R. S. Little and D. Starkey*].—Eight-year-old gelding is to be operated with plantar neurectomy. Five cubic centimeters of a solution of cocaine hydrochlorate were dissolved in equal quantity of water and adrenaline, 1 in 1,000, and injected by half on each side of the site for the high operation. A few minutes after, the animal became restless and sweated profusely. There were tremblings, slight twitchings of the muscles of the hind quarters and some unsteadiness in the gait. There was some hyperthesia, short abdominal respiration. Temperature, 101° F.; pulse 50, hard and strong at first and later dropping to 40. These symptoms subsided gradually, but took half an hour before they disappeared entirely. The operation was performed when the symptoms had sufficiently diminished to allow it. After being well rubbed and dried, the horse was taken home.—(*Veter. Record*.)

EMPIRICAL THERAPEUTICS [*J. G.*].—Records of peculiar and curious therapeutics of little scientific renown.

1°. Pure-bred short-horn heifer had occasional diarrhœa and was unthrifty. She is now reduced to the condition of a walking skeleton. Every mode of treatment has failed to help her. A proprietary article, mostly made up of tobacco, was given to her. The effect was marvelous and recovery rapidly followed.

2°. Two-year-old bull had diarrhœa; all forms of treatment failed, and the animal gets thin and weak. Quarter of a pound of black cut Cavendish tobacco is boiled in two quarts of water, divided in three doses. One is given every day for three days in succession. The diarrhœa gradually diminished, stopped and in a week normal feces were passed.

3°. Three-year-old cow had red water, was in the last stages and in condition of dying. She is turned out in a field where there was a tub containing water, where it had remained for at

least two weeks. It was covered with green slime and had a bad odor. The cow was thirsty; she emptied the whole tub almost. The next day the urine was considerably clearer, and on the second day it was quite clear. The cow made a good recovery.—(*Veter. Record*.)

FRENCH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

EXOSTOSIS OF THE VERTEBRAL COLUMN CAUSES HEMORRHAGE OF THE VENA CAVA [*Lieut. Lagaillarde, Army Veterinarian*].—*Vigilante*, aged 14 years, after jumping a bar, falls down, remains on costal decubitus for one minute and gets up. She staggers for a few steps and then appears in normal condition. She is placed in observation. The next day she is taken out, moves a little stiff first, but trots well and at the end of the path where she is exercised a short and sudden turn is made. Suddenly she staggers, drops and, unable to rise, she is transported to her stall, where, after hours of manifestations of internal hemorrhage, she dies.

At the autopsy the abdomen was found full of blood. There is a big clot between the peritoneum and the superior wall of the abdominal and pelvic cavities. The vena cava has, opposite the vertebral column, a large laceration with ragged edges; the posterior aorta is irregularly contracted by pressure of exostosis, occupying the bodies of the dorsal and lumbar vertebrae. An ankylosing osteitis has transformed the vertebral column into a stiff rod by ossification of the vertebral cartilages and union of the bodies of the vertebrae, which are more or less covered with bony deposits of various size. The last lumbar vertebra has one, triangular and sharp, which is opposite the vena cava and the cause of the venous injury. Besides these lesions the mare had ankylosis of both hocks, lesions of endocarditis and cardiac hypertrophy.—(*Revue Veter.*)

ACTINOMYCOSIS IN A CAT [*Prof. Dr. V. Ball and Mr. Roguet*].—Pulmonary actinomycosis, observed in man, cattle, sheep, pigs and dogs, has been reported only by Hutyra and Mareck as having been found in two kittens. The authors publish one found in a six-and-a-half-year-old black cat. He had alveolodental osteo-periostitis on a level with the inferior maxillary bone, marked dyspnoea, and a rather frequent cough. Placed in observation, he died after five days. At the autopsy there was

found a double chyliform pleurisy with abundant exudation. The pleura was covered with yellowish fibrinous exudates. The lungs were the seat of pseudo-lobar broncho-pneumonia with grey hepatization and grey yellowish centers. The lymphatic glands were enlarged, greyish and yellowish spots. Parasitic tufts were also observed in the center of the pneumonic cellular lesions. These actino- mycosic tufts were well marked.—(*Journ. de Zootechn.*)

TELLURATE OF SODA IN CANCEROUS NEOFORMATIONS [*Mr. P. Pierre*].—After the results related by Wasserman, the writer records the following as experiment: A slut, operated two years before, for a tumor of the mammae and which had recovered, was again six months after brought to Mr. Pierre because of a kick she had received on the right forearm, which had given rise to a tumor, which was rapidly getting as big as the fist. Three removals were followed by three returns of the growth and besides by the appearance of centers of generalization on the lumbar and right costal regions. The anti-brachial and the lumbar tumor received, each, three injections of 2 c.c. of saturated solution of tellurate of soda, made three days apart. On the sixth day the lumbar growth underwent cystic transformation, as described by Wasserman, with the escape of blackish discharge, and the anti-brachial tumors presented fluctuating spots which on puncture gave escape to the same blackish discharge. The microscopic examination of the growth revealed their nature, viz., epithelioma of mammary origin.—(*Rec. de Medec. Veter.*)

INTESTINAL OBSTRUCTIONS IN RUMINANTS [*J. Guittard*].—For the author these affections can be classified as *complete* by invagination or hemorrhage and *incomplete*.

1. *Complete obstruction* by invagination or volvulus are indicated by violent colics that subside after a few hours, but never disappear entirely. And again by the stretched position of the body on the four extremities, flatulency after the second day, standing position longer and in preference to the decubital, pulse running down to 100, 110, 120. Expulsive efforts. Rectal examination reveals a smooth, bosselated mass. Complete anorexia. No tympanitis. Glairy feces tainted with blood.

2. *Obstruction by Hemorrhage*. Such similar symptoms, except stretched position on the four legs; feces sanious, brownish and glairy.

3. *Incomplete Obstructions*. They are due to limited invagination, intestinal contraction, peritoneal adhesions. If colics are

present, they are slight and intermittent; anorexia is intermittent also. Rectal examination is negative; feces and false membranes collect in the rectum. Flatulency sometimes excessive or again intermittent.

This obstruction is more difficult to diagnose, as it may be easily mistaken for gastro-enteritis, acute enteritis, indigestion, recto-colitis, cystitis, kidney diseases, sarcoma, etc.—(*Progres Veter.*)

HETEROCHRONOUS MILK SECRETION [*MM. Ligeron and Lesage*].—Relatively frequent in young children, such cases are exceptional in animals. Although few are on record, not only amongst females, but also in male individuals. For instance, that of Madel who saw a two-days-old colt give milk for six weeks and that of Barbazan who visited a male goat of two years, which performed his functions of male normally and gave excellent milk from two inguinal teats situated in front of the spermatic cord.

The case of the writers was a filly which, from birth and before she could stand up, and running from her mammae a creamy white fluid, resembling milk. From birth, the mammae of this little animal grew larger, and on the fourth day they were as large as a big hen's egg and secreted more than 150 c.c. of very white milk. Applications of populeum ointment were made, and after three weeks the secretion was reduced to only a few drops.—(*Bullet. de la Soc. Centr.*)

RARE TUBERCULOUS LESIONS IN BOVINES [*Prof. Dr. Fairise and Mr. J. Charton, Army Veterinarian*].—Two cows in fair condition showed these lesions, viz., on the synovial bursa, which allows the gliding of the tendons of the semi-tendinosus, the adductor of the thigh, and the tibial apo-neurosis over the bony structures underneath. In one cow the lesion existed in both stifles, and on the other only on the right one. They were all alike. On the living animal they consisted in a swelling on the internal face and a little in front of the femoro-tibio-patellar joint region, forming a very hard mass. After slaughter they appeared as a discoidal mass, 10 or 12 centimeters round, situated under the tendons mentioned and covered with a thick fibrous envelope. The inside was divided by sclerous septa forming small cavities filled with caseous or caseo-calcareous matters. *There were no other macroscopic tuberculous lesions in the lungs, nor in the lymphatic system.* Histological sections made showed clearly the tuberculous nature of these masses.—(*Rev. Gener. de Medec. Veter.*)

SOCIETY MEETINGS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

The fiftieth annual convention of the American Veterinary Medical Association was called to order at the Hotel Astor, New York City, on Monday, September 1, 1913, at 10.45 a. m., by the President, Dr. John R. Mohler, who said: "*Ladies and Gentlemen:* The fiftieth annual meeting of the American Veterinary Medical Association is now formally declared in session. It is indeed highly pleasurable to me to see such a large number of friends and visitors here this morning to attend this convention, and I sincerely trust you will all enjoy yourselves most pleasantly, and that we shall have a successful meeting.

"Now, we have with us this morning a gentleman who has shown his friendship for our profession on numerous occasions, and I take great pleasure in introducing to you the Honorable J. A. Goulden, United States Representative in Congress from New York, who will deliver an address of welcome to this beautiful and prosperous city."

CONGRESSMAN GOULDEN'S ADDRESS OF WELCOME: *Mr. President, and Ladies and Gentlemen*—This is an unexpected pleasure, and a privilege that I am enjoying this morning. Last evening, at about half-past eight, one of my constituents got busy over the telephone. I sometimes regret that I have a telephone in my house. But he got busy and, as a consequence, I am here this morning to take the place of the chief magistrate of this city, the distinguished mayor, Honorable William J. Gaynor—not at his request, but at the request of my good friend, the gentleman who is sitting on the platform here with me this morning, Dr. Ellis. I regret exceedingly that his Honor the Mayor is not here, for I consider him one of the happiest men; that is, a man who makes the happiest speeches of any man I ever met upon an occasion of this kind, especially in extending greetings and a cordial welcome to the city. Whether it is too much politics, or the heat that is operating to keep him away, I do not know, but I know that unless he had been ill, or some-

thing important had occurred, he would have been here this morning to have greeted you.

It is a pleasure to welcome a body of ladies and gentlemen such as this to the metropolis of the country. You are an intelligent body of men, and you are engaged in a work that is meeting the commendation of every one who understands it, and which is gradually becoming better known. I am told that since you allowed the ladies to participate in your gatherings, that since you admitted them into the convention held some eleven years ago (and I believe I am right about that), that the attendance has been much larger, and that everything goes along smoother and better, easier and nicer. That is as it should be. You know that away back, many years ago, the Lord decided that it was not well for man to be alone, and so he created him a mate, and from that day to this we have always been delighted and glad to have the Eves with the Adams, not alone upon occasions such as this, but on every occasion. The fact is, we enjoy their presence and company.

The work in which you are engaged is of that high order that it must of necessity commend itself to the American people. I regret that some people at Washington did not appreciate the bill which passed the House about a year ago giving the veterinarians in the army a rank. That bill passed the House (of which I am glad to be a member and have been for about ten years) unanimously. It was sent over to the Senate, and I regret to say that a man from the far West pigeon-holed the bill. I liked it because I believe you are entitled to it. I believe you will never accomplish what you should—and what can be accomplished in the army unless veterinary surgeons are entitled to some recognition in the way of proper rank by law? Now they are simply looked upon in the light of non-commissioned officers, but with no standing whatever, and in order that they may do the work which is highly necessary in the army they should do, they must be given a proper standing. This is necessary not alone for the sake of the beast, but for the standing of the men as well, and until Congress gives them this rank, I think you will not have fully accomplished the work which you have sought to do. Upon an examination of the exhibition at the other end of the building, I took notice of many interesting things, and it has been to me a source of the greatest gratification as well as of study to feel that you are doing what I am convinced you are—for the uplift not only of the dumb beast, but of the human family as well. It is my pleasure to be connected with two large

institutions in this country, one an agricultural school, or college, and the other the State Soldiers and Sailors' Home at Bath, and I note that through the veterinarians of the state we have accomplished a great deal of good in the eradication of tuberculosis from our large herds of cattle. I am firmly convinced (I am not undertaking to talk technically at all, because I know very little about the matter from that side), but I am firmly convinced that the work in which you are engaged is not only of great benefit to the poor dumb beast, but it is of exceedingly great value and benefit to the human race. Both features of it are to be commended. Both are to be praised and both are entitled to the serious consideration of the world at large, and when your work is once understood, as it is becoming understood, you will have no trouble whatever in receiving that encouragement and assistance to which you are entitled. Your business to-day is entitled to recognition as a profession—a learned profession—because in your ranks are men of education, men of standing, and men of character. Perhaps twenty-five or thirty years ago it might have been somewhat different. In those days the term "horse doctor" was considered as a fitting appellation for the veterinary surgeon. That has passed away. I have not heard that for a long time, and I therefore congratulate you that you are by your own efforts, and by the beneficial character of the work in which you are engaged, and by the results which you have achieved, gradually forcing yourselves into the proud position, with higher activity, as members of a learned profession.

Now, we are sincerely glad to have you come to New York, a city noted for its great developments along all lines, noted for its commercial supremacy, noted for its institutions of learning, for its schools, and its academies, its colleges and universities. New York stands well to the front, not only among the cities of America, but among the cities of the world, as a great commercial centre, noted for its activities along all lines of human endeavor; therefore, we are glad to have so distinguished and learned a body of men and women as are numbered among the members of this association present here to-day, and we extend to you a cordial greeting. We bid you a hearty welcome, and we hope that your deliberations here will be of benefit not alone to yourselves but to mankind at large, and that you may go away from here feeling that New York City is a good place to visit, and that New York City is a good place in which to spend some time. Therefore, in the name of the people, I bid you a most cordial, a most hearty welcome, not only to our city, but to our homes, and to our hearts. Again I bid you, every one, a cordial welcome to New York City. (Applause.)

PRESIDENT MOHLER—I am certain that we all appreciate the cordial welcome which has been extended to us by Congressman Goulden, and I shall now call upon one of the oldest and most honored members of the association, Dr. W. Horace Hoskins, to respond to this address of welcome.

DR. HOSKINS' RESPONSE TO THE ADDRESS OF WELCOME:
Mr. President, Congressman Goulden, Ladies and Gentlemen, Fellow Members of the Veterinary Profession—I deem it a special privilege this morning to be called upon to answer, or to respond to this address of welcome to this great city of New York. I am doubly wedded to this great city and this great state in two particular ways. First, I am one of the graduates of one of the earliest veterinary institutions in this land, one that has spent its existence in this city; and secondly, I am wedded to this association and to its great service for the public good, because it had its birthplace in this great city. New York has been, as a state, prodigal indeed in all that has pertained to the veterinary profession, and in the relation of that profession to the people of this country. It gave it a private institution which was the first of the veterinary colleges that have maintained a continuous existence from its inception in 1857 up to the present time. New York was likewise one of the first states that has recognized her duty to her people and made the study of veterinary medicine possible by the establishment of two state schools. We have long recognized the duty of the state to take up as a part of her duty the support of veterinary education and veterinary science, because the work in which we are engaged is not one which promises affluence, to say nothing of competence in old age. It is a public service. We are engaged in the great work of extending animal industry, and its association, and the veterinary profession is having, as a part of this service, the control and eradication as well as the amelioration of the effects and causes of those diseases that are transmissible from the lower animals to man. In another way, New York has been prodigal to the veterinary profession in this land, in giving to it some of those men who have led the profession for more than fifty years. In sunny France there rests, in the evening of his life, Prof. A. Liautard, the founder of the first school in this city in 1857, and the only living man who has had continuous membership in this association from its inception in this city in 1863 to the present hour, the one man above all others who has had deep in his heart the advancement and progress of veterinary medicine along the lines in which he

established it. We are living to-day, fifty years after the birth of this association under the same code of ethics, and under the same ideals that he contributed so much to establish fifty years ago. We have no legal entanglements of any kind, but are bound one to another for the moral uplift of our profession and for its progress and advancement by the principles of conduct which he was among the first to point out and establish, and in speaking of these, we must not forget that up in the central portion of the state there lingers another man in the evening of a well-spent life, Professor Law, another of the pioneers who early established a veterinary course in connection with Cornell University. He has lived to see as the result of his labor the growth of one of the strongest state veterinary schools that we have in this country, and so I might go on and speak of what New York has given to us in the way of men from these schools to this country, who have borne such an important part in the advancement of veterinary medicine and in their contributions to the success of the federal department established by the United States Government, the Bureau of Animal Industry, and to the success of the veterinary departments which have been established by the various state governments. New York has been prodigal indeed in its contributions to the advancement of animal industry, in the solution of those problems that have confronted the profession, and in the production of those men who have contributed so much to make the veterinary profession a respected and honored one wherever it is known; who were ready at all times for useful service in the uplifting of men in this profession and to the fellowship of its members, and to all departments of the great progress which this country has made along veterinary lines. We are here to-day to celebrate this fiftieth anniversary. This golden occasion, with a membership on our rolls of almost two thousand men; with eleven hundred men of our profession engaged in work in connection with the federal government, and hundreds of them in state and municipal governments—all of them rendering a service to this country that cannot be mentioned in any monetary sense, because their work is for the protection of human life from infancy to old age. I am very thankful indeed to have this privilege of coming back to this city to renew all these pleasant reminiscences of my college days, and to think over anew the aims and purposes that were instilled in me there, and that I have seen nurtured into the growth and advancement of this association to a degree almost beyond that of any other science. I am delighted again

to know that this progress has been largely made in its infancy, and its growth almost by the personal efforts of a large number of men who never lost sight of the duty which every man owes to his fellow man in public service, and so when we meet here to-day, and think these thoughts mingling in our minds with these recollections of our progress, we should indeed be a happy and contented body. We have lived a life of public service in the interests of our fellow men that commends our work not only to the people of our own country, where so much has been done for the advancement of our profession, but to all mankind, all over the world.

PRESIDENT MOHLER—I regret exceedingly to have to announce that owing to the serious illness of Mrs. Liautard, it was impossible for our honorary president to accept our invitation to honor us with his presence to-day. I am just in receipt of a cablegram, which I will take the liberty of reading.

CABLEGRAM FROM DR. LIAUTARD.

“Paris, France.

“*President, Veterinary Association, New York:*

“Your honorary president, between the sentimental duties that call him to America to-day, and those terribly sad duties of family which would not permit his presence with you on this great occasion, begs to be excused for his inevitable absence. He hopes that no one will blame him, and that among his friends they will find the excuse that he asks in exchange for the very warmest wishes that once again, perhaps the last, he sends to the veterinary profession of America.

“A. LIAUTARD.”

We have also received a letter from Prof. Liautard enclosing his presidential address, together with a personal request from him as follows:

“I trust that my address may be read by my sincere and distinguished friend, Dr. R. W. Ellis.”

I therefore take pleasure in introducing to you this morning Dr. R. W. Ellis, who will read the address which was sent over by Dr. Liautard.

DR. LIAUTARD'S ADDRESS.

Mr. President, Ladies and Gentlemen, My Dear Confreres— When two years ago I received from the President of the American Veterinary Medical Association the nomination of Honorary Chairman of your Committee of Arrangements to celebrate the 50th anniversary of the foundation of our National Association, and when later I was told by the Acting Chairman of said Committee that I was expected to address you on "The American Veterinary Medical Association," my heart was filled with great pride and an uncontrollable joy. Great pride to have been selected among so many of you, better acquainted with each other, and where one could be found, who would treat the subject in a far superior manner, with better words, but not more friendly feelings than I would. And a great joy, as at last the imperious necessity and obligations, the almost unavoidable necessity that I had watched and looked for since years, had at last come to me; namely, that of being once more among you, with all my professional friends, with so many of my boys.

Why then, am I not present on this occasion? Why then, instead of being here shaking your cordial hands, smiling at the pleasant recollections of happy days past, and celebrating with you this great day of the 50th anniversary of our national organization? Why am I not here?

There are in the life of a man obstacles that come against him, interfere with all his wishes, paralyze all his efforts, kill all his plans, no matter what he may do, no matter what his hopes have been, his desires, his good will may have planned, even when they have been prepared and entertained for years.

Such has been the case with me on this occasion. The great pride that your selection had awoke in me, will remain but the joy of a moment. I must be deprived of it, and leave it to make place for a very sad and deep disappointment.

Let me then beg of you to excuse me, and ask you to believe that it is with a heart full of regrets that I have to be away, and to permit me to hand to one of my friends among you my reply to the subject.

Let me do it now, and as I have heard that speakers would be allowed but a short time for occupying the floor, I shall be concise. Anyhow, it is said that short speeches are always the best. I will try to be brief.

Having the advantage, if it is one, of being the only original survivor present at the organization of our national institution,

with your kind permission, it will become me in replying to the subject, The American Veterinary Medical Association, to pass a concise review of her history. But in doing it, let me ask your indulgence. Fifty years is a good long lapse of time. Many events have occurred since. Our growth, our importance, the good that we have done, have increased as years have accumulated, and to speak of our origin and our progressive life, I have in my hands no official documents, almost no records. On my personal souvenirs I have to depend to tell how from a few we have come to be the home of all those who to-day compose the American Veterinary Medical Association. If I commit any errors, if I omit some specific mention, I hope they will be overlooked and put on the account of an over-fatigued and perhaps over-trained brain.

* * *

Gentlemen, the history of our grand Association can be divided into three periods. A first, beginning at its fundamental origin, involving birth, organization and early development. It extends from 1863 to 1889.

In a second, which dates from 1890, when it has reached the age of maturity, when she spreads her influence and manifests her growth, her importance, and reaches to 1898.

And a third stage, when in full development, when she has under her shelter, not only almost all the States of this great Republic, but adds to her active membership veterinarians from beyond her frontiers. Third period, which covers the time from 1898 to the present day.

In 1863, on the 9th day of June, a meeting was held in New York, in the old Astor House, in the lower part of Broadway.

This meeting had been called by the invitation of some veterinary practitioners of Philadelphia. In the old minute book of the Association will be found the first official reports of that meeting. As secretary, I had the honor to enter them.

At the Astor House there were represented only seven States: New York, Massachusetts, Pennsylvania, New Jersey, Delaware, Maine and Ohio. And among the gentlemen who were present and had the honor to form the organization, I may be allowed here to recall their names: From Pennsylvania, MacClure, Jennings, the two Raynor brothers, Mitchener; from New York, Doctor Large, A. S. Copeman, John Busteed, C. C. Grice and myself; from Delaware, Wisdom; from Maine, Flagg; from Ohio, J. C. Myers; from Massachusetts, Robert and C. M. Wood, William and Robert Saunders, Ripley, Thayer and Josiah H. Stickney.

I cannot remember who represented New Jersey. But anyhow the call had been acknowledged and properly answered.

The gentlemen present were all veterinary practitioners, with few regular graduates. The first were self-made men, but their love for their profession was made evident by the earnest way that they manifested in answering the call for the meeting, in its organization, as well as by the energy and the real professional manner with which they carried on the work expected of them. You must bear in mind that in those days there were no American regular graduates in the United States, and that only few foreign veterinary graduates were found here and there. The fact of their objects being successfully carried out by those self-made men, self-educated gentlemen in their most minute professional acts and conduct, speaks highly of their efforts in behalf of our profession.

The meeting at the Astor House was not, however, specially called for veterinarians, others were present, physicians, agriculturists and so forth, and on the first day the foundation stone being laid, on the second day the roll-call was signed by some forty gentlemen present. It is true that many dropped out after this call, but nevertheless the United States Veterinary Medical Association was born, was organized, its constitution carefully prepared, was adopted, a board of officers was elected, with Doctor Josiah H. Stickney, M.R.C.V.S., graduate of London, as president, and a seal with a motto unanimously adopted, which for years afterwards was applied on the certificates that were delivered to newly elected members. I do not know if it is to-day. The seal represented a centaur, the motto read, *Non Nobis Solum*.

When the meeting adjourned it was expected that the original plans would be carried out and that semi-annual meetings would be held in New York and Boston. The first being the annual in September, the latter in March.

These semi-annual reunions were held very regularly. The discussion of papers, the presentation of specimens of pathological interest, records of cases, consideration of subjects of value and importance from a professional point of view, and even some clinical work, occupied the time. And although the attendance was not always very large, the interest was never lacking, the enthusiasm remaining the same, and the object of the Association was never lost sight of, the earnestness and hopes of the members were always the same; namely, that the United States Veterinary Medical Association would one day become, par excellence, the bearer of the professional flag throughout the whole country!

And yet Boston and New York were the only places selected for the semi-annual meetings!

But times changed. The profession grew larger, schools had been opened and were bringing out regular graduates. They wanted to join and did join the Association. If at the beginning the Eastern States were principally prominent in the Association, others from the West had come, joined, and furnished many members.

A desire for greater magnitude was gradually manifested by all, and in remaining with the semi-annual meetings, as at the beginning, it seemed as if the U. S. V. M. Association was too confined; was, so to speak, limited, one sided, and her beneficial importance and influence arrested in their growth, and then having become of age, and reached her twenty-one years of good life, she made a grand effort, a valuable change, by deciding to hold thereafter the annual meetings in New York, and the semi-annuals in various cities in the country; and, following the advice of Horace Greeley's at that time popular saying, "To Go West," the U. S. V. M. Association went West, and held first an annual meeting in Cincinnati, which was followed successively by the semi-annuals of Philadelphia, Baltimore and Boston. In September, 1889, an annual gathering took place in Brooklyn.

Was there a semi-annual held after that? I have no recollection, no record of it. But I know well that at that time the Association had reached her 25 years, and that she had gathered under her wing nearly as many states, having indeed representatives from Massachusetts, New Jersey, Pennsylvania, Connecticut, Rhode Island, Virginia, Maryland, Ohio, Nebraska, Maine, South Carolina, Delaware, Kentucky, Michigan, Illinois, Indiana, Wisconsin, Missouri, Minnesota and South Dakota.

We are far from the day of organization and the work that the U. S. V. M. Association had to her credit, since the first meeting at the Astor House.

To review it, even concisely, would take too much time and wear out your patience. Think what you are to-day and judge of the difficulties she had to overcome!

With the large number of states represented in the membership of the Association, she had certainly realized her first object and become the national veterinary body of America. Here ends the first period of her existence.

* * *

Gentlemen, we are entering on the second stage of the life of the U. S. V. M. Association. If a little over twenty-five years

have been necessary for the raising and growth of the organization, the second period will cover less time. Of course, the hardest part of the work had been done. We are in 1890, at Chicago, when the 27th anniversary meeting was held. But although it was that of the U. S. V. M. Association, a greater name was in the minds, on the lips of many, it was a meeting of the great national association of the veterinarians of America, East and West, North and South. At that meeting we were then proud of our number, one hundred and twenty members having answered the roll call.

And then we went on and held the annual meetings in Washington in '91, Boston in '92, Chicago again in '93, for the Columbian Celebration, where the meeting was also called for the first International Congress of American Veterinarians. We went, in 1894, to Philadelphia, to Des Moines in '95, Buffalo in '96, Nashville in '97, and finally in '98 at Omaha.

During that period of eight years the semi-annual meetings were replaced by meetings of the Comitia Minora.

We have now arrived at the end of the second period of the life of the U. S. V. M. Association. As I have already said, it is not necessary, nor is it possible, to review the immense amount of good work that has been done, nor the enormous influence that the Association has had upon the elevation of our profession, the improvements in our colleges, the valuable changes, or how by her efforts and her will the education of veterinarians has been raised, extended and brought to the standing that it holds to-day. By the energy that she has deployed every branch connected with veterinary medicine has benefited, and all of us veterinarians can be proud of her. Read our professional journals, born of her bosom, and in them you will find recorded all her past doings, and tell me if she does not deserve well of our profession, and if we have not the right to look at her records with *fierté*, with pride.

And now I must close these remarks. The U. S. V. M. Association is no more, she has changed her name?

* * *

The third period is now open!

We are in 1898, at Omaha! The old Association receives a second christening. She becomes the American Veterinary Medical Association of to-day.

Her history is but the continuation of her former life, and her membership is larger than that of any other similar body in the world. Her work is known, recognized and appreciated in

every scientific veterinary centre, for she will forever remain the solid representative of our profession in the new world. She has stretched her roots in every specialty of our branch of medicine. Civil practitioners, who look after the health of our domestic and pet animals, Agricultural Veterinarians, who look after the improvement of live stock and breeding; Army veterinarians; Sanitarians, who protect the health of our citizens; Milk Inspectors, who watch the food of our little ones; workers in their laboratories; Investigators of the Bureau of Animal Industry, everywhere the A. V. M. Association finds many of her worthy members.

It is true that some of our confrères are still laying off, they hesitate to join us, but let them have their time, make a little propaganda, and no doubt they will come if we only show them that the Association has proved and will always remain, true to her original motto, *Non Nobis Solum*—"Not For Us Alone."

Mr. President, ladies and gentlemen, in closing these remarks with my sincere thanks for your kindness for having listened so attentively, while I glance back over fifty years and think of those good pioneers of our profession that were there and now are gone, permit me to ask you to join me in wishing the everlasting and constantly growing grandeur of the American Veterinary Medical Association, and with the poet say:

"Let her live long and prosper,
And her shadow never grow less!"

PRESIDENT MOHLER'S ADDRESS.

Fellow Members of the Association and Friends—Through your kindness it has fallen to my lot to deliver the Presidential Address in a year which will always be conspicuous in the history of our association, and on a day which is intended to mark its semi-centennial anniversary. To have one's name enrolled amongst the 33 eminent men who have preceded me in this office is indeed an honor which naturally can come only to a few of the fourteen hundred who are numbered in this organization. At such a time our minds are necessarily occupied by thoughts of the past and of the future.

Fifty years ago there assembled in this city a coterie of loyal members of our profession who founded the United States Veterinary Medical Association. This meeting took place in 1863 in the midst of the disturbing influences coincident with the Civil

War, and was attended by a few veterinarians from each of seven states. Josiah Stickney was elected president and Alexander Liautard secretary. Of this loyal band of pioneers all save Liautard have passed from our activities, while he lives to-day to act as the honorary president on this birthday anniversary. It is given to few men to serve actively as a member of any organization for a period covering half a century, but this unusual experience characterizes the membership of our friend and colleague, Dr. Liautard, to whom we all extend greetings and best wishes on this natal day. The original meeting occurred on June 9 at the Astor House, when the nation was in the throes of civil strife and threatened dismemberment, and the armies of the North and the South were campaigning just prior to the great battle of Gettysburg. Yet in the midst of these frightful disasters, at a time when everything seemed in an irrevocable turmoil, there were found some indomitable veterinarians sufficiently resolute to brave the existing storm, sufficiently clear-sighted to prepare for the future. It was reserved for these men to be the first to conceive in wisdom and establish in strength an association qualified to meet successfully the purpose of the founders and to serve triumphantly as one of the pioneers of veterinary societies. Undeterred by the lack of numbers and unyielding to the clamor of radicalism, it has held fast consistently to a sane equilibrium and has demonstrated its merits by its survival. Remembering those who founded in wisdom and in faith and those who guided in loyalty and zeal, this glad half-century of consistent and successful endeavor is looked upon by us all with unstinted admiration. In a short time, thanks to the feverish activity of the corps of practitioners who carried on the youthful association, there grew up a strong sturdy organization. Meager as was the number of veterinarians who became charter members of this association, it doubtless was as great in proportion to the available men as is the greatly increased number of colleagues who now avail themselves of the opportunities here presented for securing membership in the leading veterinary association in the world. The growth of this association has been commensurate with the development of the nation. Its members have gone from its portals to take the lead in all movements for the development of veterinary science and its resources; they have been foremost in all actions having for their object the improvement of our profession and the betterment of animal life. And I doubt not that this great association will go steadily and grandly forward, keeping step with the onward march of human-

ity, broadening its work and increasing its usefulness throughout the years that are to come.

The acquirement of knowledge in the domain of animal diseases during the last 5 decades has been constant and amazing and compares favorably with the progress in other branches of science which has attracted the admiration of the world. As chemistry and physics have advanced from alchemy, and astronomy from astrology, so has veterinary medicine progressed from empiricism and become scientific. The most notable progress that has been made relates to the discovery of the class of infectious diseases and the mode of their conquest. As it is manifestly impossible in the time at my disposal to cover the details of development in all lines of veterinary medicine, it is deemed advisable to confine my remarks to the subject of infectious diseases, the study of which has done most to improve the health of domestic animals and at the same time to place our profession on a plane with the other learned sciences.

Coincident with the organization of the United States Veterinary Medical Association was the birth of our knowledge of pathogenic organisms, since the transmissibility of the anthrax bacillus by inoculation was discovered by Davaine in 1863. Two years later Villemin proved the infectiousness of tuberculosis and transmitted the disease from man to animals, while in 1867 Lister made his brilliant deduction that suppuration and septic processes in wounds were a species of fermentation which could be prevented by the use of germicides. The wonderful results of modern operative surgery have been made possible by the adoption of antiseptic and aseptic methods in the treatment of wounds and in the operating room. One of the most important contributions to the study of infectious diseases was the introduction of the "plating" method with solid culture media by Koch in 1881. Other discoveries which greatly aided the progress of this science were the adoption of the Abbe illuminating apparatus, immersion lenses, and aniline dyes for staining the bacteria. Beginning with the bacterium of chicken cholera discovered by Pasteur in 1880, a number of pathogenic bacteria were described during the ensuing years in rapid succession. The more important of these were the great discovery of the tubercle bacillus by Koch in 1882, Pasteur's researches on swine erysipelas in the same year, the isolation of the bacillus of glanders by Loeffler and Schutz in 1883, and the discovery of the tetanus bacillus by Nicolaier in 1884. From this date until 1892 few important discoveries were made, most of the

work done consisting in the perfection of the methods of investigation. However, the application of the newly gained knowledge concerning pathogenic bacteria to the prevention and cure of these diseases was begun almost immediately. What a revolution in veterinary thought and practice has resulted can be appreciated only by comparing the text-books of 25 years ago with those of the present day. Pasteur working on the theory that resistance to a disease could be produced by causing a mild attack of the affection, was able to produce immunity against a number of diseases of the lower animals. His classic experiments with anthrax vaccine are well known, as is also his method of protection against rabies by the use of an attenuated virus. Similarly we take pride in the pioneer work of two of our members, Salmon and Smith, who, in December, 1885, began a series of experiments, the results of which clearly established the principle that the injection of sterilized cultures or dead bacteria confers active immunity to subsequent inoculation with virulent materials. Here then was the beginning of the foundation upon which rests our present knowledge of vaccine therapy that to-day is attracting so much favorable attention both for preventing and healing disease. The priority of this successful accomplishment was duly recognized by Hueppe in his writings in 1888, although the students of Pasteur made claim to the honor. Their work, however, was not begun until the following March. The general application of this method to therapeutics must be accredited especially to Wright of London.

Another very important principle which is so intimately associated with the names of Salmon, Smith and Kilborne, was the determination of the cause of Texas fever and the method of its transmission through the agency of the cattle tick. It is of interest to note that this was the first experimental proof furnished on the subject of diseases borne by insects, or diseases that can be carried from one animal to another only by an intermediary host. This mode of transmitting infections has since become quite familiar to the public by the discovery that certain mosquitoes of different species spread malaria and yellow fever to man. Other insects—flies, ticks, lice and fleas—have been found to carry infectious diseases from one person or animal to another, and the future may show that insects play a most important part in diseases other than those of which we have present knowledge. The discovery of the plasmodia, piroplasmata and trypanosomes as causes of certain diseases of man and animals was the precursor of the enormous work which has been accom-

plished in establishing the relationship between various protozoa and diseases of man and animals. In 1903 Novy and McNeil succeeded in growing pathogenic protozoa in pure culture in a manner similar to the cultivation of bacteria. The discoveries of tuberculin in 1890 by Koch, mallein in the same year by Kelning, and tetanus and diphtheria antitoxin in the blood of animals injected with the toxins of these respective bacilli are additional milestones in the history of veterinary science. The specific etiology of many diseases of animals still remains unknown, while others have been only partially elucidated by the discovery of the filterability of their invisible causative agents. The first of these filterable viruses was discovered by Loeffler 15 years ago in the lymph of cattle affected with foot-and-mouth disease. At the present time 14 diseases of animals are known that are caused by this class of invisible organisms. One of these is on the verge of visibility—the organism of contagious pleuro-pneumonia. As a rule this class of infections confers a high degree of immunity which is permanent. In some instances, as in rinderpest and hog cholera, it has been possible to produce an actively immune animal without thereby causing severe disease, by injecting the virus and at the same time the corresponding immune serum. This principle of simultaneous injection of immune serum and virulent blood was evolved by Kolle and Turner for rinderpest in 1898 and by Dorset, McBryde and Niles for hog cholera in 1905.

It is encouraging to reflect that the progress of bacteriology, like the progress of this association, has been made by gradual and logical steps. The great discoveries, a few of the more important of which have been mentioned, were not lucky accidents, but were planned and studied with great patience and deliberation. Their number has ever grown, and hence a new branch of knowledge has become available for the prevention of disease. This knowledge is being utilized largely for the diagnosis of communicable maladies, and for the application of measures of protection which previously had been dependent solely upon the clinical symptoms of disease. With the study of methods of conferring the power of resistance to the invasion of pathogenic bacteria has grown the study of the processes of immunity. Such perfected methods are represented by the specific products which have reduced the dangers from rabies almost to zero, and the liability of tetanus after protective injections to a vanishing point.

New facts and conceptions of absorbing interest in immunity

studies have been disclosed in an abundance and with a rapidity which is simply bewildering. The later developments are so abstruse and complex as to daunt all but the most resolute inquirer. Though we are still hardly beyond the threshold of the problem, the results already attained have compelled us to recast our views as to the very nature of infection and its prevention. Theory after theory has arisen and then has been swept aside, not to disappear utterly, but to be melted in the crucible of research till the refuse was burnt away. In 1884 Metchnikoff first published his famous explanation of immunity by phagocytosis, while it seems but yesterday that the striking researches of von Behring bade fair to explain immunity in terms of anti-toxin. Then Ehrlich developed his schematic studies of the "side-chain" theory, which, though brilliant, was only a working hypothesis. But the march of time has shown that they are only a part of the whole truth. In fact, the whirlpool into which these theories were leading us has been bridged by the recently developed theory of anti-ferments that appears to furnish us a more definite foundation for our explanation of immunity. We are still living within the era of its first achievements and therefore we may reasonably hope that this is merely the dawn of its beneficent results.

In proportion to our recognition of the fact that it is through ferments and toxins that bacteria exert their injurious power, the direction of research is changing and chemical examination is taking a large place in pathological inquiry. We now know that even when the actual bacteria have been destroyed by heat, the solutions containing them will produce toxic symptoms on injection in an animal or man. If the quantity is too small to produce serious symptoms it causes a reaction and anti-bodies are formed which counteract the effect of the living bacteria which are present or that may afterwards gain entrance. This power of producing immunity is now becoming of very great practical service. One finds to a certain extent the same anti-power in relation to ferments. The active digestive ferments in the intestinal canal are rendered inactive during their absorption through the intestinal walls.

During the last few years certain objections have been raised to Ehrlich's theory of immunity on the ground that the results obtained by experiments do not harmonize with the suggested hypothesis. Abderhalden has proved by his studies that enzymes or ferments present in the blood play an important part in the economy of the organism, not only from the true physiological

standpoint, but also from a pathological aspect. He shows that all the processes which are going on in the organism are of a chemical nature, but are governed by certain physical conditions of the body cells and their substrata from which they obtain their nourishment. The chemical changes produced are gradual, not abrupt, as usually supposed; and one or more enzymes take up the process of decomposition and synthesis where the other enzymes have ceased to be active. The actual processes noted in these changes are either reduction, oxidation or hydration. When considered in the light of immunity, it is seen that these chemical changes may be protective or destructive in nature. In this connection Abderhalden found that, after introducing certain foreign substances into the blood stream, enzymes were produced which acted specifically towards the foreign bodies. In other words, they destroyed or rendered them non-toxic. This shows a way in which the body protects itself against the invasion of foreign micro-organisms. He also proved that under certain physiological conditions, as pregnancy, the blood serum contains substances which are capable of hydrolizing the proteins of the placenta. Changes of a like character could also be noted in infectious diseases, such as tuberculosis and glanders and also in pernicious anemia of horses, while Rosenthal obtained the reaction in cases of carcinoma, nephritis and other diseases in man. The methods of noting the changes taking place are two, one which makes use of the polariscope in which the rotation of the serum of the subject when acting on a certain substrat is observed, and the other utilizes the process of dialysis. In the latter case the end products produced by the serum when exposed to a certain substrat are detected by a chemical reagent. These findings are enough to show that a certain equilibrium exists amongst the enzymes present in the organism under normal conditions, and when once this equilibrium is destroyed other enzymes or anti-enzymes are produced, or some of the enzymes present are increased in quantity.

Rothe and Bierbaum have recently published certain far-reaching results in the immunization of cattle with tubercle bacilli which appear to be of considerable importance to the study of immunity in tuberculosis. They aimed to find a method whereby larger amounts of tuberculous anti-bodies could be produced. For this purpose cattle were injected intravenously with variously treated tubercle bacilli and products thereof. A marked and prompt production of anti-bodies was noted which usually reached their height on the seventh day to persist into

the second month, when a pronounced diminution or even total disappearance would take place. Quite similar results were obtained in the case of horses also. Having established conclusively that anti-tuberculous substances can be produced, the effect of repeated intravenous injections of dead bacilli was tested and the results indicate that a considerable protection against virulent bacilli can be created by this method. Perhaps the most important result of this work, so far as immediate availability for practical use is concerned, is that by means of the serum of such animals, which is rich in tuberculous anti-bodies, it may become feasible to test the various tuberculins, of which such a large number are offered for sale, for their actual content in specific derivatives of tubercle bacilli, by means of test-tube methods. We long have needed some easily applied test of this kind, in order to exercise some control of commercial tuberculins, and it now seems that this may be possible.

The centre around which both human and veterinary science revolve is comparative pathology. Most of the diseases observed in man affect also domestic animals, and their course follows the same law. Comparison between constitutional and organic diseases of man and animals is already a means of widening the circle and adding to science. The work done in the domain of infectious diseases has shown how advantageous and even necessary is the co-operation of the veterinarian and the physician. These infections have been thoroughly studied by competent men belonging to both professions, and one of the principal factors in this union is the honest, conservative research work of many prominent representatives of our profession in all countries. In fact, the growth of veterinary medicine is intimately connected with the progress of human medicine. Hippocrates, Aristotle, Celsus and Galien recognized the advantages which could be derived from the comparison of the diseases of men and those of animals. While they practiced human medicine, they dissected animals, and from the observations they made, derived a better insight into the diseases of man. It may be correctly said that all that was at that time known of human pathology was taken from animals and applied to man. In the middle ages the epizootics and deaths among animals were ascribed to the influence of the stars, to the punishment of heaven, to sorcery or the Evil One. We can judge of the influence those ideas had on the people by what we see even in our day of such imaginary diseases as "Wolf-in-the-tail" and "Hollow-Horn." Then came the days when philosophical speculations were explained;

it was the time of dogmas. Then medicine became separate from surgery, and the latter being considered of inferior rank was consigned to the barber shops, while veterinary practice was referred to the blacksmiths. This state of affairs continued until the first half of the nineteenth century. Isolated from other sciences, veterinary medicine progressed slowly and contented itself with making sound practitioners. With the development of physical and natural sciences, veterinary medicine entered on new paths, and important discoveries were made. The erection of veterinary schools was becoming less infrequent, and by degrees a profession of skilled veterinarians was established, of which to-day we all feel proud.

One cannot contemplate the development of these veterinary institutions without a feeling of admiration in their achievements and a conviction that the phase of education which they typify is destined to become more and more important in America. The essential basis and foundation of a nation's welfare is to be found in its educational conditions. It is true that those abstract qualities which contribute to national greatness and patriotic citizenship are the offspring of ideals rather than of material things, but these can never come to their fullest fruition without that substantial foundation afforded by rational and well-balanced educational forces. Humboldt, the German philosopher, has truly declared that "whatever you put into the state, you must first put into the schools," and it is equally true that the standing of the veterinary profession is dependent on the strength of its schools.

No one factor has been more successful in elevating the standard of veterinary institutions in America than the investigation of their curricula and equipment by the Bureau of Animal Industry in conjunction with the U. S. Civil Service Commission. While the primary object of such supervision was to make it possible for the Government to obtain men better educated and better qualified for its veterinary work, it nevertheless succeeded in raising the standard of veterinary education in the United States and enabled the students to obtain greater and better facilities for study. These schools have made large expenditures of money and have greatly augmented and improved their facilities. The Government had previously taken an active part in helping to improve veterinary education. When in 1894 the veterinary inspectors of the Bureau were placed in the classified service, it was necessary for applicants to be graduates of veterinary colleges. In 1899 a step in advance was taken when

it was demanded that the graduate should be from a college having a course of not less than 3 years. Six months later this was changed to refer to graduates after 1897, while those before this date were eligible if from a 2-year college. In 1903 a further stipulation was made to the effect that graduates from a college having a 3-year course must have spent at least 2 years in the study of veterinary science. This prevented the colleges from giving two years' credit to students from agricultural, medical, dental and other colleges.

This association likewise has been an aggressive factor in improving educational facilities in our colleges. Prior to January 1, 1893, it was possible for graduates of 2-year schools to become members of this association, but at that time the barrier was placed so that it was necessary for applicants to have graduated from a 3-year school, having at least four veterinarians on the faculty. However, the 2-year graduates of any school which adopted the 3-year course could qualify, provided they had been five years in actual practice. During the last two years the association has had a committee on veterinary colleges at work inspecting and investigating the matriculation and course of studies in these veterinary colleges with an appropriation for expenses, and the results have well repaid the time and money expended. The various committees on intelligence and education have likewise given this subject faithful consideration, but systematic visitations of the schools were never undertaken. Another potent agency in the advance of veterinary teaching may be found in the establishment of the State Boards of Veterinary Examiners. These boards, which have been created in almost all the states, have set standards which have forced the colleges to meet them. The entrance examination now required by our schools is another factor in improving veterinary education by securing a better class of students who are more able to comprehend the various studies in the course.

Veterinary science will always be subject to reversals. Its progress has been and always will be a series of advances and retrogressions with the outposts of knowledge steadily advancing. All this but emphasizes the supreme importance of organizing inquiry on a thorough-going basis, coupled with a judicious conservatism in the formulation of conclusions. The broader and more tributary the field over which the collection of details is extended, the more certain is the scientific worth of the results obtained.

A lack of training in the fundamental principles is evidenced

in the results from time to time reported of research work or investigations, as pursued by observers thus disqualified for the task which they have undertaken. Eternal warfare between truth and error is a record of the conflicts between knowledge and ignorance—conflicts that are oftentimes intensified by the inclusion of the personal element, leading to conditions that further complicate the problem and overshadow the main issue until all recognition of its importance is lost. But there is an important mitigating factor affecting the case of the man who, with the courage of his ignorance, vehemently asserts that he knows. This factor is the honesty of his belief in the evidence of what he calls his own experience and his faith that what he himself has experienced cannot be wrong. It is, however, just that kind of faith that is earliest destroyed by systematic training in precise methods of scientific observations and reasoning. Research, so called, has been carried to an absurd excess by men who have ventured alone into the scientific jungles with the hope of finding something, but without definite aim or fundamental knowledge or landmarks. It would seem advisable that no apparent discovery, made by a man who has not established a scientific status, should be accepted as such without a trial by a commission composed of scientists of established reputation.

It is quite generally conceded that the value of scientific discoveries and deductions is dependent upon their authorship. When new results are brought to our attention, the first inquiry is for the name of the author, and several factors enter into our judgment of his work. These are (1) his personal equipment; (2) his motive, and (3) his environment. The primary consideration is the man. Unripe minds will naturally produce pseudo-science, and much so-called science is being forced upon our attention to-day that is unripe, undigested. The personal side of research must begin with the proper training and preparation to conduct research that is worthy of the name, and until we find the man fitted for this work, such accessories as money, equipment, apparatus, etc., cannot be efficiently applied. As an illustration of my theme that great things have been accomplished in the smallest quarters with primitive facilities, it may be interesting to know that the best research work accomplished by Prof. Ostertag was in a reconstructed hot-house, while Theobald Smith's renowned work on Texas fever was carried on in a poorly equipped garret of a four-story building. The goddess of science donates her treasures mostly to those who desire them for their own sake, and not for the sake of the riches they may

bring. In these days of money-making invention we need a renaissance of the spirit which inspired and upheld the fathers of our profession in their strenuous labors, both scientific and practical, that have laid the foundations of modern veterinary medicine.

Professionally, we guard the greatest income-producing property in both the United States and Canada. Few appreciate the vast investment which we have in these countries in domesticated animals. There are, I believe, not less than five billions of dollars invested in the various kinds of domesticated animals in the United States, and on every side this vast investment is threatened by pestilence and disease. In fact, government statistics will show that the loss of farm animals last year in this country alone comprised over 6½ million swine, nearly 2 million cattle, over 2½ million sheep, and more than half a million horses and mules—the total value exceeding two hundred millions of dollars. And it is the universal opinion of competent men who make a study of this subject that a large proportion of this loss can be eliminated by judicious sanitary measures. The greatest mortality is among swine. Something like nine-tenths of that is due to hog cholera; and cholera, though not absolutely preventable at present, can be very greatly reduced by judicious application of serum, together with proper sanitary control. The improvement and the protection of such interests as these are worthy of the most earnest consideration of both statesmen and scientists. This association is working not only for the alleviation of the suffering and loss of domesticated animals, but also for the protection of the public health. We have in view both of these problems, and there are many diseases which we are investigating and endeavoring to control, the suppression of which will mean as much to the human race as it does to dumb creation, for which we are the especial guardians. Until recently our meat supply was ample with some to spare. Only six years ago we exported from the United States half a million cattle, and over four hundred million pounds of beef. Now exports have almost ceased, principally because of the home demand. We have only 23 cattle to the square mile, while Belgium has 164 and Denmark 144. However, any such intensive scheme of beef production is bound to be more expensive than the former methods of raising cattle on the vast grass-lands of the open range. But some compensation may be had by saving even a part of the yearly preventable waste of food animals and thereby reducing the problem of high prices, for the consumer finally

pays for the loss of animals that perish from disease, as well as for the healthy animals which are used for food.

A review of American veterinary progress would not be complete without some mention of the achievements of two Government bureaus that are under veterinary direction and the activities of which are largely in the domain of veterinary science—the Canadian Health of Animals Branch and the United States Bureau of Animal Industry. In the relatively short periods of their existence these organizations have made a remarkable record, both in scientific research and in the administrative application of scientific knowledge and have thus thrown luster on the veterinary profession.

Veterinarians have always constituted a large proportion of the force of their employees, and at present in the Bureau of Animal Industry alone they number 993.

If the scientific staff of the Bureau of Animal Industry had never done anything more than to make the classic discovery of the mode of transmission of Texas fever by the cattle tick, the bureau's existence would have been amply worth while. This discovery established a new principle in medical science, the extent of the application of which the world is only beginning to realize as we learn to conquer in turn such maladies as yellow fever, malaria and sleeping sickness. It has made possible such triumphs of sanitary science as have been accomplished on the Isthmus of Panama, and without which the great canal could not have been constructed so expeditiously and with so little loss of human life.

In the prevention and eradication of animal diseases the bureau has been of the greatest economic service. On several occasions it has saved the live-stock industry of the country from disaster and ruin. The immediate cause of the organization of the bureau was the presence of contagious pleuro-pneumonia of cattle, which had been introduced in some way from abroad and, becoming established in the eastern states, had spread as far west as Illinois. It was only after several years of effort that this insidious and stubborn disease was completely stamped out, and it has not since reappeared.

Twice the bureau has had to deal with outbreaks of foot-and-mouth disease, first in New England, and later in some of the eastern and middle western states. Each time the disease was conquered after prompt and vigorous work by a well-organized force of trained veterinarians and assistants. Even when we consider the experience of European countries that have struggled

in vain for many years to get rid of this malady, it is difficult for us to appreciate the value of the work which prevented this infection from becoming established in this country and from spreading to the great stock-raising regions of the West. In studying the origin of the latest outbreak, it was found that the infection was due to contaminated imported vaccine virus, and an interesting case of symbiosis of vaccinia and foot-and-mouth disease was discovered and demonstrated.

For many years the presence of cattle ticks and the infection of Texas fever have made it necessary to maintain a quarantine on cattle in a large area in the southern part of the United States. The movement of these cattle to northern markets has been permitted only under restrictions which entailed expense and lowered prices. The disease was a great disadvantage to the infected region and prevented the development of cattle raising there. The losses and damage have been variously estimated at from \$40,000,000 to \$200,000,000 a year. Applying the knowledge gained as to the nature of the disease, the life history and habits of the ticks and methods for their destruction, the bureau with local help has during the past seven years waged a highly successful warfare of extermination against the ticks. The territory freed of infection in this time now amounts to nearly 200,000 square miles and almost equals in extent the combined areas of Tennessee, Georgia, Alabama and Mississippi. More than one-fourth of the territory originally infected has now been cleared, and we may look forward to the time when a great section of our country, naturally suited to cattle raising, will do its part toward supplying beef to feed our growing population.

Armed with an effective weapon against hog cholera in the preventive serum already mentioned, the bureau has given battle to this disease, which for so many years has wrought havoc to the hog raiser. Systematic work has been started, and with the experience of previous conquests it is not too much to hope that in time this work will also meet with success.

In tuberculosis we have the greatest problem that confronts veterinary officials. In the research work leading up to our present knowledge of this plague of animals and man, the veterinary profession has had a most creditable part, and the Bureau of Animal Industry has made valuable contributions to this knowledge. The task before us is to adopt administrative means which will repress and, if possible, eventually eradicate this disease from our domestic animals. The successful control of cattle mange, sheep scab, dourine and other infections are examples of similar veterinary achievements.

The United States Meat Inspection Service constitutes the largest piece of veterinary administrative work in the world. Inspection is maintained at 786 establishments in 222 cities and towns, requiring the services of about 2,500 employees, including a large proportion of veterinarians, who make all final decisions on post mortem. A high standard of efficiency obtains, and the results compare favorably with the service in other countries. It is interesting to note that in the attacks of 1906 no fault was found in any case with the veterinary work.

Taken as a whole, the large number of employees constituting the great administrative body of the Bureau of Animal Industry are a conscientious and efficient force of men who deserve well of both the profession and the public, whose welfare they constantly guard. In their loyalty to the former they are necessarily loyal to the latter, for their interests are inseparable.

By research and educational propaganda the bureau has been a strong element in the general improvement in milk. The adoption of the score-card system of inspection and the advocacy of pasteurization at 145° for 30 minutes, which does not injure the nutritive or digestive qualities of the milk, have been important factors in milk sanitation.

In these and many other ways the bureau has given the world valuable scientific knowledge, has benefited humanity, protected health, performed economic service to stock-raising interests and reflected credit on the veterinary profession.

The increasing use of sera and vaccines in veterinary practice has made it desirable to obtain federal and state legislation, in order to supervise the preparation of such products. Biological remedies have an important place in the field of sanitary medicine, and this field is constantly becoming larger and more important. Some of these products, however, have been found to be frauds and a menace to the live-stock industry. It is, therefore, with much pleasure that I report the recent passage of bills regulating the sale of these products by the states of Alabama, Georgia, Pennsylvania and by the Congress of the United States. In Europe these products are prepared by private firms under state control as in Germany, or they are manufactured by the government itself as in Holland. In the latter instance legislative measures are unnecessary.

That there is a promising future for this most recent branch of therapeutics may be frankly admitted, but there is a risk of allowing enthusiasm to outrun discretion in the claims which the advocates of these products urge in their favor.

It has been stated that the veterinarian of the future will be an immunologist. We all agree in hoping that it may be in his power to afford immunity to his patients from as many diseases as possible. But I submit that he must continue to be in the future as he has been in the past, above all things a man of wide clinical experience. No matter how great the advance of science may be in the future, there never will be a royal road to veterinary medicine. It will be the common road that all must tread who aspire to treat disease, and after the class-room has been left behind it will be through the stable, the farm, or the ranch, the post-mortem field, and the clinical laboratory and will always lead back to the side of the diseased animal.

During the past year the spirit of our members and the energetic team work of the officers and committees of the association were highly commendable, and I wish to express my sincere appreciation of their valued services. I cannot refrain from mentioning especially the aid I received from our painstaking secretary and the indefatigable labors of the chairman of the legislative and publication committee. I have kept in close touch with the activities of the various committees, and I trust that their recommendations will be given careful consideration by the executive committee. The assignment of certain lines of work and investigation to special committees is an admirable arrangement, and I hope that this method of apportioning the problems of the association will be even further extended in the future. I do not deem it necessary to make any specific recommendations at this time, as I am satisfied that you will give your earnest consideration to all matters which will be brought before you during the meeting, and in passing judgment on the different aspects of the subject you will always be guided by motives which will be for the benefit of our association and the welfare of our profession.

I fain would speak of many other matters, but I have been warned not to trespass on your patience by speaking at too great length, and the warning is full of wisdom. However, before closing my address, it is fitting that I should pause, if only for a moment, to call to mind with affection and reverence those great men who honored and delighted this association for years and who have conferred such high distinction upon the position of the veterinarian. I refer to men like Stickney, Michener, Large, Miller, the Rayner brothers, Andrew Smith, Huidekoper, Clement, Roscoe Bell, Pearson, Harger, Dougherty and many others. With what amazing industry, versatility and keenness

of intellect did they unfalteringly cultivate the field of veterinary science! With what devotion and beneficial results did they give their time and abundant knowledge to the service of the public and of our profession! To-day we mourn their loss, but rejoice in the rich fruitage of their past friendship.

From the history of veterinary medicine let veterinarians draw confidence in the invincible strength of their science, which, though at one time despised even by the well-informed, has during the last five decades attained such great importance and such wide influence in the life of this and other countries. And let them take fresh courage and make new resolutions to rival all the other professions in useful work to be accomplished in the 50 years to come. Let them also remember with gratitude and veneration those not of our profession who, supervising veterinary sanitation, early recognized the value of such control work and aided in its organization.

To-day far-reaching questions of great importance are agitating the association. Whatever the outcome, let us hope that this, the greatest association the members of our profession have ever seen, may in no measure depart from the high traditions it has ever set before it, but rather increase its usefulness to the profession and to the public.

Gentlemen, I have no fear for the future of veterinary medicine. I have an equally confident belief that in the times to come those who practice it will be held in increasing honor, and of him who is faithful to its high traditions it will be said, "Many shall commend his understanding."

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THE PAPERS AND DISCUSSIONS.

There was probably never such a lot of splendid papers, covering every phase of veterinary science, presented at any previous meeting, as were presented to the New York meeting; and the discussions were of just such a high quality. So that an immense wealth of material has been gathered at the several sections, for publication in the proceedings. So much, in fact, that it would almost seem to us that two volumes would have to replace the customary one volume of previous years. That is only an impression, however, and we have no data to verify it.

SECRETARY'S AND TREASURER'S REPORT.

Secretary Marshall's report was along the same lines as advocated by him last year. He also referred to the advisability of a permanent secretary with sufficient salary to make it possible

for him to give his entire time to it. The full report will be published in the proceedings.

TREASURER WHITE'S REPORT, as stated in the September issue of the REVIEW, on page 668, shows a balance in treasury to the credit of the AMERICAN VETERINARY MEDICAL ASSOCIATION, of \$3,162.23.

THE PATHOLOGICAL EXHIBIT.

One of the most instructive as well as interesting features of the meeting was the pathological exhibit in College Hall. This collection of pathological specimens, embracing nearly all the diseases of cattle, sheep and swine, were the most beautifully prepared and mounted specimens that it has been our pleasure and privilege to examine, and we believe that was the general impression on those present. The members and visitors at the A. V. M. A. meeting had the privilege of examining this rare collection, the property of the United States Bureau of Animal Industry, through the courtesy of President John R. Mohler, of the A. V. M. A., Chief of the Pathological Division of the B. A. I.

The exquisite work in the preparation of this collection of watch-glass specimens, we understand, was executed by one of our A. V. M. A. members who was present at the meeting, but whose modesty restrained him from mentioning the fact, even when present at the exhibit, as he occasionally was, and would quietly explain some particular specimen to an inquiring visitor. We refer to D. L. Enos Day, Veterinary Inspector, in charge of the Branch Pathological Laboratory of the Bureau of Animal Industry at Chicago. Dr. Day certainly is to be complimented on his exquisite work, and deserves a vote of thanks from the entire veterinary profession of America, which we now extend to him through the AMERICAN VETERINARY REVIEW.

EXHIBIT OF HORSES' SHOES AND PATHOLOGICAL CONDITIONS OF HORSES' HOOFS.—Also in College Hall, just opposite the pathological exhibit of the U. S. Bureau of Animal Industry, there was a most interesting collection of horse shoes of various designs to overcome certain diseased conditions and incorrect forms of hoofs; also quite a number of dry specimens of diseased and deformed hoofs. This interesting exhibit was kindly loaned by the Veterinary School of the University of Pennsylvania.

THE BANQUET.

About three hundred persons assembled in the beautiful north ballroom of the Hotel Astor at the banquet on the evening of September 4. The dinner was conceded to be an excellent one, and the speaking that followed unusually interesting. This function of the meeting was voted a success by those who attended it.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

(JUNE MEETING).

The regular monthly meeting of this association was called to order by President McKinney at 8.45 p. m., June 4, 1913.

The minutes of the May meeting were read and approved.

The prosecuting committee reported progress.

Dr. K. F. Meyer, Director of the Pennsylvania State Live Stock Sanitary Board was then introduced and gave an instructive address entitled, "The Discussion of Several Interesting Diseases."

Dr. Meyer stated that some more accurate test is needed for glanders, as even mallein has proven to be about 25 per cent. inaccurate. He also said that in 2,000 head tested with the dry mallein, the results were gratifying, as this method proved to be 98 per cent. accurate. In the eye test the small amount of mallein used and absorbed from the conjunctiva will cause a rise in temperature, and a typical reaction should show pus and tears discharging from the eye, visible at a distance of ten or fifteen feet, eyelids swelled, photophobia, marked lachrymation and sensitiveness to touch. The reaction is most pronounced from about the 12th to the 15th hour, but should subside in 24 hours. Can retest 24 hours later with same amount, and in a glandered animal the reaction is very pronounced, the eyelids being glued together, whereas in a doubtful case the eye will clear up. The advantage of this method is that it has no effect on the results of the sera tests. Blood tests after the use of mallein will show positive glanders in from six to ninety days.

Dr. Meyer also mentioned the disease known as epizootic lymphangitis or, as he says it should be called, sporotichosis.

The yeast of this disease cannot be cultivated. The clinical picture presented by a case of this kind is almost identical to

farcy. At the beginning it always starts with a nodule and forms a funnel-shaped ulcer. The pus is more green, sticky and clumpy. Majority of cases occur in right hind limb, and the infection generally enters from a wound and may spread over the entire body, but does not affect the internal organs.

It is not contagious or epizootic. It is contracted on the watersheds of the Alleghany and Ohio sections from a fungus growth on the bark of logs.

The curative agent used is the iodide of potash.

Also mentioned abortion in mares which has not been so fully studied as abortion in cattle. This condition is due to a bacillus related to the typhoid group.

In answer to the question by Dr. Chase as to what progress had been made in the treatment of abortion by the use of a vaccine, Dr. Meyer stated that a revolution had taken place regarding immunization with vaccines, as the living cultures cannot be used in pregnant animals. The commercial vaccines cause sterility.

Dr. Berns stated that he had been experimenting with the ophthalmic test for the past two weeks and asks what causes the local reaction, and local reaction only, in glandered horse, and glandered horse only.

Dr. Meyer said that immune bodies and specific antigen come together in the conjunctiva as well as the rest of the system. We get the same local reaction in a subcutaneous injection. The complement cannot act on antigen in a healthy horse because there are no immune bodies.

Dr. Clayton asked how long will living bacilli remain in the system.

Dr. Meyer answered, about one year, and also stated that the abortion test is about 87 per cent. correct.

The best treatment is isolation, flushing out, and mechanical cleansing.

Dr. J. A. McLaughlin, of New York City, then read an interesting paper entitled, "Dystokia in the Bitch. Some Observations Made While Performing the Caesarian Operation." The doctor gave a detailed account of his experience with this condition, citing several cases, and recommends that the Caesarian operation be performed before too much time has elapsed, and other useless measures been employed.

This interesting subject was discussed by several of the members present. Dr. Gill moved that a vote of thanks be extended the essayists of the evening. Seconded and unanimously carried.

Dr. W. L. Johnson, whose application had been favorably reported on by the Board of Censors, was unanimously elected a member of the association.

Dr. Berns expressed his thanks for the expression of sympathy tendered him by the association in his recent bereavement.

Dr. Ackerman also thanked the association likewise.

Dr. Berns also reminded the members that the great A. V. M. A. meeting was not far off, and a large fund would be necessary to entertain the members and guests, and urged that liberal contributions be sent to Dr. Cochran at once.

Dr. Ellis stated that he took great pleasure in announcing that the Governor had signed the College Bill on May 24, 1913, thus perpetuating the old school as a State college.

Dr. W. Horace Hoskins, of Philadelphia, spoke of the alumni being gratified by the signing of this bill, and also spoke of the Army Bill, known as House Bill No. 4541, urging every veterinarian to give it his support.

After a discussion of various subjects the meeting adjourned.

The president appointed Drs. Berns, Ellis and Blair as delegates to the A. V. M. A. and the New York State Veterinary Medical Society meeting.

ROBT. S. MACKELLAR, Secy.

MISSISSIPPI STATE VETERINARY MEDICAL ASSOCIATION.

The seventh annual meeting of this association was held on August 29, 1913, at the Agricultural College, at Starksville, Miss.

The president of the association being absent, the organization was called to order by the Vice-President, Dr. B. M. Leigh, of Meridian, Miss.

The meeting was one of peculiar interest to the live stock industry of Mississippi. Many important matters of special interest to the profession were considered by the association; one of which was an act to be strongly presented to the Legislature in January, regulating the practice of Veterinary Surgery, Medicine and Dentistry in Mississippi, which is sure to come in time.

Three were admitted to membership. Several interesting papers were presented.

This association has a membership consisting of practically

every graduate veterinarian in the State, and its perfect harmony is the most pleasing feature of the organization.

Committee appointed on Legislation, Drs. Wm. P. Ferguson, Grenada, Miss.; John Oliver, Columbus, Miss.; E. M. Ranck, State Veterinarian, Agricultural College, Miss.

The next meeting of the association will be held at the A. and M. College, Starksville, Miss., December 29, 1913.

Officers elected: Drs. B. M. Leigh, President, Meridian, Miss.; D. M. Davenport, Vice-President, Hattisburg, Miss.; Wm. P. Ferguson, Secretary and Treasurer, Grenada, Miss.

WM. P. FERGUSON, Secretary.

YORK COUNTY VETERINARY MEDICAL SOCIETY.

This organization held its quarterly meeting the first week in September at the National Hotel, York, and had a large attendance of veterinarians present from the city and county.

Interesting discussions occurred on the subjects of glanders, tetanus, impaction of the bowels, intestinal catarrh, bloating in cattle, chronic indigestion, parturient paresis, red milk, mamitis, etc.

The operation for roaring in horses was also thoroughly discussed; in fact, all subjects of especial interest to practitioners; and each veterinarian present departed for home feeling well repaid for the time spent in attendance at the meeting. Dr. O. C. Newhaus was elected to membership in the association.

The meeting adjourned to meet in York in December.

E. S. BANSTICKER, Secretary.

NEW YORK STATE COLLEGE AT NEW YORK UNIVERSITY OPENED.—Just as we were closing our forms we received the announcement from New York University of the opening of the veterinary school as a state institution, which was to take place at the University buildings, Washington Square East, on September 24th. The opening address to be made by the Chancellor, Dr. Elmer Ellsworth Brown. Other speakers, Dr. Egbert Le Fevre, Dean of the Medical School; Dr. W. H. Park, also of the Medical Department; Dr. W. Horace Hoskins, of Philadelphia, an alumnus of the Veterinary School, and others. An account of it will be given in our next number.

NEWS AND ITEMS.

A. V. M. A. NOTES.

The registration was 947 at our last count.

The association increased its membership 232 members during the New York meeting.

Prof. Franz Hutyra, Dean of the Royal Veterinary High School, Budapest, Hungary, Prof. Robert V. Ostertag and Sir Stewart Stockman were elected honorary members at the recent meeting.

The cruise in the waters of the Hudson and New York Bay on the Steamer Rosedale on the afternoon of September 4th seemed to be a welcome relaxation from the close application at the sessions, and was much enjoyed.

Two invitations were extended to the association for the 1914 meeting, one from New Orleans, the invitation being extended by Mayor Behrman of that city, enthusiastically backed by Dr. Dalrymple, and another from the Missouri Valley veterinarians to come to Kansas City, the invitation being cordially extended by Dr. S. Stewart. No decision had been reached at the time of this writing, but there seemed to be considerable sentiment during the convention for the "Land of Romance," and we are inclined to believe that New Orleans will be chosen.

A very interesting and instructive feature of the meeting was the splendid exhibition of instruments, veterinary books, drug preparations, vaccines, etc. This is not a new feature, but the excellent arrangement connecting the exhibition hall direct with

the meeting halls added much to the attractiveness of the exhibits, which in consequence were much more satisfactory to the exhibitors, and were a source of education to the veterinarians who passed through the exhibition hall; (which, bright and prettily decorated, simulated a fancy bazaar), to and from the meetings. They seemed to find it difficult to keep out, and the exhibitors were kept busy taking orders.

The report of Chairman Hoskins of the Committee on Legislation shows that in addition to the splendid service rendered the association and the profession of the United States in the cause of the Army Veterinary Service, so well known to everyone, he was also alert to another great question of vital importance to the profession; the bill to modify and control the sale of habit-forming drugs. Dr. Hoskins learned that the bill, as it was drawn, to apply alike to veterinarians and physicians, if passed, would work a great hardship on the veterinarians. He explained this point to those introducing the bill, pointing out the fact that as applied to veterinarians nothing was to be gained by the passage of the bill in that form, but a great hardship worked upon them, and was able to have the bill so modified as to remove the objection, for which the veterinarians of the country owe him a debt of gratitude.

MAYOR GAYNOR'S SUDDEN DEATH.—It is with much regret that we record the sudden taking away of the Hon. William J. Gaynor who, as Chief Magistrate of the host city of the A. V. M. A., was to have welcomed its members to the city of New York on September 1, but for an illness that overtook him about that time, and from which he died at sea a little more than a week later. There existed a bond of sympathy between the late Mayor of New York and the veterinary profession, as he was a lover of horses. In fact, he was fond of all animals, and had many animal pets at his home at St. James, L. I. His end came while he was in harness, so to speak, as he had ceased his activities but a few days before departing for Europe to obtain the rest he so much needed. But this trip, like the one he started upon just before the A. V. M. A. members made their trip to the Pacific Coast in 1910, was not to be, and he was forced to leave unfinished much work that he had planned. *In the midst of life we are in death.*

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